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NATIONAL DAM SAFETY PROGRAM. RUSSELL TAYLOR DAM (MO 10216), MIS--ETC(U)
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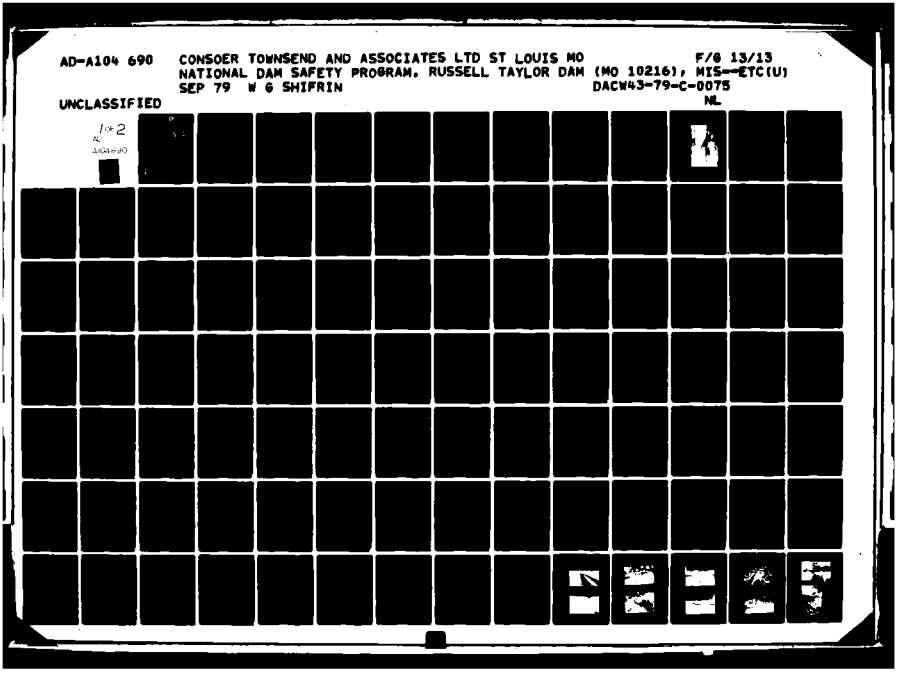

LEVEL II

1

MISSISSIPPI-SALT-QUINCY RIVER BASIN

RUSSELL TAYLOR DAM,
LINCOLN COUNTY, MISSOURI
MO. 10216

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

United States Army
Corps of Engineers
...Serving the Army
...Serving the Nation

St. Louis District

PREPARED BY: U. S. ARMY ENGINEER DISTRICT, ST. LOUIS

FOR: STATE OF MISSOURI

SEPTEMBER 1979

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Dam Safety, Lake, Dam Inspection, Private Dams

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report was prepared under the National Program of Inspection of Non-Federal Dams. This report assesses the general condition of the dam with respect to safety, based on available data and on visual inspection, to determine if the dam poses hazards to human life or property.

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 NORTH 12TH STREET
ST. LOUIS, MISSOURI 63101

IN REPLY REFER TO

SUBJECT: Russell Taylor Dam (Mo. 10216) Phase I Inspection Report

This report presents the results of field inspection and evaluation of the Russell Taylor Dam (Mo. 10216).

It was prepared under the National Program of Inspection of Non-Federal Dams.

SUBMITTED BY: SIGNED
Chief, Engineering Division — 28 SEP 1979 — Date

APPROVED BY: SIGNED
Colonel, CE, District Engineer — 28 SEP 1979 — Date

RUSSELL TAYLOR DAM

LINCOLN COUNTY, MISSOURI

MISSOURI INVENTORY NO. 10216

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

PREPARED BY
CONSOER, TOWNSEND AND ASSOCIATES LTD.
ST. LOUIS, MISSOURI
AND
ENGINEERING CONSULTANTS, INC.
ENGLEWOOD, COLORADO
A JOINT VENTURE

UNDER DIRECTION OF
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
FOR
GOVERNOR OF MISSOURI

SEPTEMBER 1979

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Russell Taylor Dam, Missouri Inv. No. 10216
State Located: Missouri
County Located: Lincoln
Stream: An unnamed tributary of Lost Creek
Date of Inspection: June 14, 1979

Assessment of General Condition

The Russell Taylor Dam was inspected by the engineering firms of Consoer, Townsend and Associates LTD., and Engineering Consultants, Inc. (A Joint Venture) of St. Louis, Missouri using the "Recommended Guidelines for Safety Inspection of Dams". These guidelines were developed by the Chief of Engineers, U.S. Army, Washington, D.C., with the help of Federal and State agencies, professional engineering organizations, and private engineers. The resulting guidelines are considered to represent a consensus of the engineering profession.

The overall structural condition of the dam appears to be good. The dam does not exhibit signs of structural instability at this time. The seepage observed on the downstream toe of the embankment does not appear to be a hazard to the structural stability of the dam, however, it should be investigated. The shallow sloughing of the upstream slope appears to have stabilized and does

not appear to have a significant effect on the structural stability of the dam. Nevertheless, the damaged area should be repaired to prevent continual sloughing of the slope.

Based on the criteria in the guidelines, the dam is in the high hazard potential classification, which means that loss of life and appreciable property loss could occur in the event of failure of the dam. The estimated damage zone extends approximately 3.5 miles downstream of the dam. Within the damage zone are four dwellings and three buildings which may be subjected to flooding, with possible damage and/or destruction, and possible loss of life. The Russell Taylor Dam is in the intermediate size classification since its height is more than 40 feet, but less than 100 feet and impounds less than 1,000 acre-feet of water.

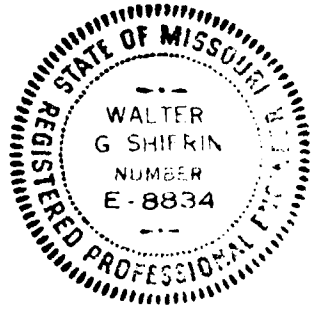
Our inspection and evaluation indicate that the spillway of Russell Taylor Dam does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. Russell Taylor Dam being an intermediate size dam, with a high hazard potential, is required by the guidelines to pass the Probable Maximum Flood without overtopping. Since there is high hazard potential downstream of the dam, the appropriate spillway design flood for this dam is the Probable Maximum Flood. It was determined that the reservoir/spillway system can accomodate 71 percent of the Probable Maximum Flood without overtopping the dam. Our evaluation indicates that the reservoir/spillway system will accomodate the 100-year flood.

The Probable Maximum Flood is defined as the flood discharge that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the region. The 100-year flood is defined as a flood having a one percent chance of being equalled or exceeded during any given year.

Other conditions noted by the inspection team were: minor seepage at the principal spillway outlet; minor erosion on the upstream slope; debris in and around the intake to the principal spillway; and the trees and debris from the downstream channel of the principal spillway.

The absence of seepage and stability analyses is a deficiency which should be corrected. Deficiency in the spillway capacity should also be corrected. Periodic inspections by a qualified engineer and establishing a maintenance log are recommended.

Walter G. Shifrin, P.E.



Overview of Russell Taylor Dam

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

RUSSELL TAYLOR DAM, I.D. No. 10216

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APPENDICES

c. Scope of Report

This report summarizes available pertinent data relating to the project; presents a summary of visual observations made during the field inspection; presents an assessment of hydrologic and hydraulic conditions at the site; presents an assessment as to the structural adequacy of the various project features; and assesses the general condition of the dam with respect to safety.

Subsurface investigations, laboratory testing, and detailed analyses were not within the scope of this study. The conclusions drawn herein, therefore, are based on the presence of, or absence of, obvious signs of distress. No warranty as to the absolute safety of the project features is implied by the conclusions presented in this report.

It should be noted that reference in this report to left or right abutments is as viewed looking downstream. Where left abutment or left side of the dam is used in this report, this also refers to northwest abutment or side, and right to the southeast abutment or side.

d. Evaluation Criteria

Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams", Appendix D. These guidelines were developed with the help of several Federal agencies and many state agencies, professional engineering organizations, and private engineers.

1.2 Description of the Project

a. Description of Dam and Appurtenances

The following description is based exclusively on the original design drawings, observations and measurements made during the visual inspection. No "as-built" drawings were available for the dam during the preparation of this report.

The dam consists of a homogeneous earthfill embankment between earthen abutments. The crest is 14 feet wide and 761 feet long as shown on available drawings. Field measurements show the crest width to be 13 feet and the length to be the same as on the drawings. The crest elevation, according to the drawings, is 621.0 feet above MSL. The maximum height of the embankment is 41.75 feet.

The downstream and upstream slopes are 1V to 2H and 1V to 3H, respectively. According to the available drawings, an 8-foot wide berm was constructed on both the downstream and upstream slopes. The berm on the downstream slope was constructed at an elevation of 600 feet above MSL. The berm on the upstream slope was constructed at an elevation of 594 feet above MSL.

According to the available drawings, a cutoff trench, with side slopes of 1V to 1H, and a base width of 10 feet, was excavated parallel to the dam axis. According to Mr. Taylor (the owner of the dam), the trench was excavated approximately 4 feet into the rock foundation.

There are two spillways for the Russell Taylor Reservoir. The principal spillway is located 250 feet to the left of the right abutment. The spillway is a 33-inch inside diameter reinforced concrete drop inlet structure which connects to a 24-inch inside diameter reinforced concrete pipe which passes under the embankment. According to the drawings, the 24-inch reinforced concrete pipe is 200 feet in length with a slope which varies from a maximum of 7.9% to a minimum of 0.9%. A 28-inch tall by 11-foot long concrete wall was constructed across the center of the drop inlet as an anti-vortex device. The concrete wall was constructed from the outside edge of the drop inlet across the opening of the drop inlet and into the embankment. A metal framework structure over the drop inlet was provided as a trashrack.

The emergency spillway is cut into the left abutment down to limestone and is a grass-lined open channel. According to the available drawings, the control section of the spillway was constructed with side slopes of 1V to 8H, a bottom width of 80 feet and a crest elevation of 614.5 feet above MSL. From field measurements, the control section of the spillway has a cross-section with side slopes of 1V to 10.6H on the east side of the channel and 1V to 5.4H on the west side, a bottom width 105 feet, and a crest elevation of 614.5 feet above MSL.

According to the plans, no livestock water supply was provided for the dam, however, from visual observation, it appeared that a livestock water supply was provided. The discharge is controled by a gate valve located on the downstream end of the pipe. The gate valve is housed in a clay pipe.

A 6-inch diameter perforated helical metal pipe was provided in the embankment as an interceptor drain. The outlet of the drain is located 2 feet 3 inches to the left of the centerline of the outlet to the principal spillway. According to the drawings, the drain was placed parallel to the crest extending 41 feet to the right of the drain outlet and 101 feet to the left of the drain outlet.

b. Location

The Russell Taylor Dam is located on an unnamed tributary of Lost Creek, Lincoln County, Missouri. The nearest downstream community is Elsberry, population 1,398, which is approximately 4.0 miles downstream. The dam and reservoir are shown on the Elsberry Quadrangle Sheet (7.5 minute series) in Section 1, Township 50 North, Range 1 East.

c. Size Classification

According to the "Recommended Guidelines for Safety Inspection of Dams", by the U.S. Department of the Army, Office of the Chief Engineer, the dam is classified in the dam size category as being "Small" since its storage is less than 1,000 acre-feet. The dam is classified as "Intermediate" in dam height category because its height is more than 40 feet, but less than 100 feet. The overall size classification is governed by the larger of the two determinations, and the classification is, accordingly, "Intermediate" in size.

d. Hazard Classification

The dam has been classified as having "High" hazard potential in the National Inventory of Dams, on the basis that in the event of failure of the dam or its appurtenances, excessive damage could occur to downstream property, together with the possibility of the loss of life. Our findings concur with this classification. Four dwellings and three buildings are located within the estimated damage zone, which extends about 3.5 miles downstream of the dam. The town of Elsberry is approximately 4.0 miles downstream of the Russell Taylor Dam.

e. Ownership

Russell Taylor Dam is owned privately by Mr. Russell Taylor. The mailing address is Mr. Russell Taylor, Route 1, Elsberry, Missouri, 64434.

f. Purpose of Dam

The purpose of the dam is for flood control.

g. Design and Construction History

The available records show that the dam was designed in March, 1956 by the Department of Agriculture, Soil Conservation Service, as part of the Lost Creek Watershed Protection Project. The design Engineer's name, as listed on the plans, is Mr. Griessel. The dam was built in 1956-57 by Ray & Briscoe, a local construction company.

h. Normal Operational Procedures

Normal procedure is to allow the Flood Control reservoir to remain as full as possible with the water level being controlled by rainfall, runoff, evaporation and the elevation of the spillway crest.

1.3 Pertinent Data*

a. Drainage Area (square miles):	1.65
b. Discharge at Damsite	
Estimated experienced maximum flood (cfs):	63
Estimated ungated spillway capacity at maximum pool elevation (cfs):	7654
c. Elevation (Feet above MSL)	
Top of dam:	621
Spillway crest:	
Principal Spillway	594
Emergency Spillway	614.5
Normal Pool	594
Maximum Pool(PMF):	622.01
d. Reservoir	
Length of maximum pool (Feet):	2200
e. Storage (Acre-Feet)	
Top of dam:	796
Spillway crest:	
Principal Spillway	30
Emergency Spillway	513
Normal Pool:	30
Maximum Pool (PMF):	863
f. Reservoir Surface (Acres)	
Top of dam:	49
Spillway crest:	
Principal Spillway	10
Emergency Spillway	38.5

Normal Pool:		10
Maximum Pool(PMF):		50.5

g. Dam

Type:	Earthfill
Length:	761 Feet
Structural Height:	41.75 Feet
Hydraulic Height:	41.75 Feet
Top width:	13 Feet
Side slopes:	
Downstream	1V to 2H
Upstream	1V to 3H
Zoning:	Homogeneous
Impervious core:	NA
Cutoff:	Cutoff trench with 10-foot bottom width and 1V to 1H side slopes
Grout curtain:	Unknown

h. Diversion and Regulating Tunnel None

i. Spillway

Type:		
Principal Spillway	Drop Inlet, Uncontrolled	
Emergency Spillway	Open Channel, Uncontrolled	
Length of weir:		
Principal Spillway	12.3 Feet	(Drop inlet spillway 2.75 feet I.D. drop pipe, 2 feet diameter connecting pipe)
Emergency Spillway	105 Feet	
Crest Elevation (feet above MSL):		
Principal Spillway		594
Emergency Spillway		614.5

j. Regulating Outlets

Type:	Livestock water supply
Length:	Unknown
Closure:	Gate valve at downstream end
Maximum Capacity:	Unknown

* The term 'maximum pool' used in this section refers to pool level at top of dam elevation unless otherwise specified.

SECTION 2 : ENGINEERING DATA

2.1 Design

Design drawings are available from the Department of Agriculture, Soil Conservation Service, and are included as part of this report. The drawings were prepared in March of 1956 by the Department of Agriculture, Soil Conservation Service. "As-built" drawings, geologic and soil mechanics reports for this dam can be obtained from the Department of Agriculture, Soil Conservation Service, however, they were not available during the preparation of this report.

2.2 Construction

No data is available concerning the construction of the dam and appurtenant structures, other than the construction history given in Section 1.2g.

2.3 Operation

No operation records are available for the Russell Taylor Dam.

2.4 Evaluation

a. Availability

The availability of engineering data is poor and consists only of the design drawings mentioned in Section 2.1, State Geological Maps and U.S.G.S. Quadrangle Sheets. "As-built" drawings, geologic and soil mechanics reports for this dam can be obtained from the Department of Agriculture, Soil Conservation Service, however, they were not available during the preparation of this report. No information on design hydrology or hydraulic design was available, nor were seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams", which is considered a deficiency.

b. Adequacy

The conclusions presented in this report are based on field measurements, the available engineering data, past performance and present condition of the dam. The data available is inadequate to evaluate the hydraulic and hydrologic capabilities of the dam. In the absence of seepage and stability analyses no quantitative evaluation of the structural stability can be made.

c. Validity

Only a set of design drawings was available for review. From field measurements, the dam appears to have been constructed according to the available drawings, except for the descrepancies described in Section 1.2a. Russell Taylor Dam was originally Structure No. 2 according to the design drawings provided by the Soil Conservation Service.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

A visual inspection of the Russell Taylor Dam was made on June 14, 1979. The following persons were present during the inspection:

Name	Affiliation	Disciplines
David J. Kerkes	Engineering Consultants, Inc.	Soils
Peter Howard	Engineering Consultants, Inc.	Geology
Mark R. Haynes	Engineering Consultants, Inc.	Civil, Structural and Mechanical
Kenneth L. Bullard	Engineering Consultants, Inc.	Hydraulics and Hydrology
Kevin J. Blume	Consoer, Townsend & Assoc., Ltd.	Civil and Structural
Russell Taylor	Owner	

Specific observations are discussed below.

b. Dam

The crest of the dam has a gravel access road across it. Outside of the roadway the crest was covered with an adequate vegetative cover. There was no evidence of significant settlement or cracking on the crest. No significant deviations in horizontal or vertical alignment were apparent. There was no evidence of the dam ever being overtopped.

The upstream slope has no riprap protection. Some very minor erosion has occurred on the slope near the water surface in several places due to wave action. Shallow surface sloughing has occurred along the upstream slope. The area of sloughing extends from approximately the right abutment area to the center of the dam and from about half way up the embankment near the right abutment to near the waterline at the center of the dam. According to Mr. Taylor, the sloughing occurred approximately 2 years ago when the snow cover on the slope started to melt and a heavy rain occurred at the same time. Several trails, which appear to be used by grazing cattle, crisscrossed the slope. The slope has an adequate cover of grass and a few bushes. The slope appeared to be unmaintained. No other depressions or settlements were apparent on the slope.

The downstream slope of the embankment has a heavy grass cover and several bushes growing on it. The slope appeared to be unmaintained. Seepage was detected approximately 170 feet from the right abutment at the toe of the downstream slope and right abutment contact. The discharge was clear at the time of the inspection and flowing at a rate

of less than 1 gpm. It is undetermined whether the seepage was flowing through the embankment and abutment contact, through the embankment or through the foundation. According to Mr. Taylor, a significant amount of seepage occurred approximately 2 years after the dam was constructed. The foundation was then grouted and the seepage was stopped. No depressions, bulges or settlements were aparent on the downstream slope. Materials removed immediately below the vegetation cover on the embankment appeared to be a clayey silt.

According to the "Missouri General Soil Map and Soil Association Descriptions" published by the Soil Conservation Service, the materials in the general area of the dam are classified as a Lindley silt loam of the Central Mississippi Valley Wooded Slopes family. The Lindley silt may be susceptible to excessive erosion. If the Lindley silt was used in the embankment, the embankment may be susceptible to erosion and failure should overtopping result during a flood.

Both the left and right abutments were approximately the same elevation as the crest of the dam. Both abutments appeared to be natural earth material which contacted shallow bedrock. Several outcrops of bedrock were observed around both abutment areas. The abutments had adequate grass protection against surface erosion. No seepage was observed in or around either abutment except for the above mentioned seepage. No evidence of slope movement was apparent in either abutment. The access road which crosses the dam goes through the emergency spillway and up the side of the spillway, across the dam crest and over the right abutment.

No signs of rodent activity in either the embankment or the abutments were apparent.

c. Project Geology

The dam is situated in the Dissect Till Plains Section of the Central Lowlands Province (Fenneman, N.M., "Physiographic of Eastern United States", 1946). In the area of the dam site, however, because it is near the Mississippi River, most of the till has been eroded. The area is characterized by gently rolling hills in the uplands with relatively steep slopes down to the water courses. The entire area exhibits a karst topography with frequent sink holes.

The rocks in the area dip regionally to the northeast off the Ozark uplift to the south. Rocks ranging in age from Ordivician to Pennsylvanian occur in the general area.

According to Mr. Taylor, the dam was founded on bedrock and that the cutoff trench was excavated approximately 4 feet into the bedrock. Limestone outcrops were observed in the immediate area of the dam. The limestone appears to be relatively thin-bedded and dense. It also appears to be cavernous. The rocks are dipping generally northward at less than three degrees. A sink hole was observed a few feet from the reservoir upstream of the left abutment.

d. Appurtenant Structures

(1) Spillway

The concrete drop inlet structure is in good condition. No spalling or cracking of the concrete was observed. The trashrack was in good condition and unclogged. Some debris in and around the area of the intake to the drop inlet was observed. The concrete anti-vortex device was also in good condition with no spalling or cracking observed. Leakage through the 24-inch diameter concrete pipe was detected. The leakage apeared to be in the drop inlet structure because the invert of the structure had standing water in it. A flow of less than 1 gpm was observed at the outlet of the conduit. No spalling or cracking of the concrete in the conduit was observed. The joints of the exposed portion of the conduit showed no sign of misalignment.

The emergency spillway was heavily covered with grass. The spillway channel was not obstructed. There was no apparent indication of instability in the slopes of the spillway.

(2) Outlet Works

No regulated outlet works was provided for the Russell Taylor Dam except for a livestock watering system. The inlet and outlet of the system were not located. The gate valve clay pipe housing was located approximately 10 feet to the northwest of the 24-inch conduit outlet and 20 feet upstream from the outlet. The gate valve was accessible.

e. Reservoir Area

The water surface elevation was 594.0 feet above MSL on the day of the inspection.

The reservoir rim is gently sloped and no indication of instability or severe erosion were readily apparent. The slopes above the reservoir are heavily grassed. Around both abutments, outcroppings of bedrock material were observed. One building was built near the shoreline.

f. Downstream Channel

The downstream channel of the 24-inch conduit was a well-defined, rock lined channel. The channel was obstructed with a fence, trees and debris. The downstream channel for the emergency spillway is a well-defined, grass-lined, unobstructed channel.

3.2 Evaluation

The visual inspection did not reveal any items which are sufficiently significant to indicate a need for immediate remedial action.

The following problems were observed which could affect the safety of the dam or which will require maintenance within a reasonable period of time.

1. The obstructions in the downstream channel of the principal spillway.

2. The erosion of the upstream slope due to wave action.

3. The shallow surface sloughing of the upstream slope.

4. Seepage along the downstream toe near the right abutment.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

Russell Taylor Dam is used primarily for flood control. It was built as part of the Lost Creek Watershed Protection Project. The only operating facility is a livestock watering system which is no longer used. The water level in the reservoir is allowed to remain as full as possible, and is controlled by rainfall, runoff, evaporation and the elevation of the spillway crest.

4.2 Maintenance of Dam

The dam is maintained primarily by the owner, Mr. Russell Taylor. Corrective and remedial measures are performed as they are needed. The dam crest and slopes are kept fairly clear of large trees and bushes.

According to Mr. Taylor, seepage through the foundation occurred two years after initial construction. The area, where the seepage occured, was grouted and the seepage was stopped. No other major repairs have been done to the dam since its original construction.

4.3 Maintenance of Operating Facilities

The livestock watering system is no longer used.

4.4 Description of Any Warning System in Effect

The inspection team is not aware of any existing warning system in effect.

4.5 Evaluation

The maintenance of the dam appears to be infrequent, however, the dam does not appear to be neglected. The remedial measures described in Section 7 should be undertaken within a reasonable period of time.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design

The watershed area of the Russell Taylor Dam upstream from the dam axis consists of approximately 1,056 acres. About 50 percent of the watershed area is w oded and covered with grass and the rest of the area is agricultural land. Land gradients in the higher regions of the watershed average roughly 12 percent, and in the lower areas surrounding the reservoir average about 5 percent. The Russell Taylor Dam is located on an unnamed tributary of Lost Creek. The reservoir is about 1.3 miles upstream from the confluence of the unnamed tributary and Lost Creek. At its longest arm the watershed is approximately 2 miles long. A drainage map showing the watershed area is presented as Plate 1 in Appendix B.

Evaluation of the hydraulic and hydrologic features of Russell Taylor Dam was based on criteria set forth in the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams, and additional guidance provided by the St. Louis District of the Corps of Engineers. The Probable Maximum Flood (PMF) was calculated from the Probable Maximum Precipitation (PMP) using the methods outlined in the U.S. Weather Bureau Publication, Hydrometeorological Report No. 33. The probable maximum storm duration was set at 24 hours, and storm rainfall distribution was based on criteria given in EM 1110-2-1411 (Standard Project Storm). The SCS method was used

for deriving the unit hydrograph, utilizing the Corps of Engineers' computer program HEC-1, (Dam Safety Version). The unit hydrograph parameters are presented in Appendix B. The SCS method was also used for determining loss rate. The hydrologic soil group of the watershed was determined by use of published soil maps. The hydrologic soil group of the watershed and the SCS curve number are also presented in Appendix B. The curve number, unit hydrograph parameters, PMP index rainfall and the percentages for various durations were directly input to the HEC-1 (Dam Safety Version) computer program to obtain the PMF hydrograph. The computed peak discharges of the PMF and one-half of the PMF are 13,775 cfs and 6,888 cfs, respectively.

Both the PMF and one-half of the PMF inflow hydrographs were routed through the reservoir by the Modified Puls Method also utilizing the HEC-1 (Dam Safety Version) computer program. The reservoir was assumed at the principal spillway crest level at the start of the routing computation. The peak outflow discharges for the PMF and one-half of the PMF are 11,529 and 4,730 cfs, respectively. Only the PMF when routed through the reservoir results in overtopping of the dam.

The stage-outflow relation for the spillway was prepared from field notes and sketches prepared during the field inspection, and limited design drawings. The reservoir stage-capacity data were based on the U.S.G.S. Elsberry, Missouri Quadrangle topographic map (7.5 minute series). The spillway and overtop rating curve and the reservoir capacity curve are presented in Plates 2 & 3, respectively, in Appendix B.

From the standpoint of dam safety, the hydrologic design of a dam aims at avoiding overtopping. Overtopping is especially dangerous for an earth dam because the downrush of waters over the crest can erode the dam embankment and release all the stored water suddenly into the downstream floodplain. The safe hydrologic design of a dam requires a spillway crest height that can handle a very large and exceedingly rare flood without overtopping.

The Corps of Engineers designs its dams to safely pass the Probable Maximum Flood that is estimated could be generated from the upstream watershed. This is the generally accepted criterion for major dams throughout the world, and is the standard for dam safety where overtopping would pose any threat to human life. According to the Corps criteria, the hydrologic requirement for safety for this dam is the capability to pass the Probable Maximum Flood without overtopping.

b. Experience Data

It is believed that no records of reservoir stage or spillway discharge are maintained for this site. Nevertheless, according to the owner, the maximum reservoir level was about 12 feet above the crest of the principal spillway.

c. Visual Observations

Observations made of the spillway during the visual inspection are discussed in Section 3.1c(1) and evaluated in Section 3.2.

d. Overtopping Potential

As indicated in Section 5.1-a, only the Probable Maximum Flood, when routed through the reservoir, resulted in overtopping of the dam. The peak outflow discharges for the PMF and one-half of the PMF are 11,529 and 4,730 cfs, respectively. The PMF overtopped the dam crest by 1.01 feet. The spillway/reservoir system can accomodate one-half of the PMF with a freeboard of 0.58 feet. The total duration of embankment overflow is 0.75 hours during the PMF. The spillway and the reservoir of Russell Taylor Dam are capable of accomodating a flood equal to approximately 71 percent of the PMF just before overtopping the dam. The 100-year flood is equal to approximately 14 percent of the PMF. The spillway/reservoir system will accomodate the 100-year flood without overtopping the dam.

The failure of the dam could cause extensive damage to the property downstream of the dam and possible loss of life. Four dwellings and three buildings are located along the downstream channel within the damage zone which extends about 3.5 miles downstream from the dam. The town of Elsberry is about 4.0 miles downstream of the dam.

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

There were no signs of settlement or distress observed on the embankment or foundation during the visual inspection. The upstream and downstream slopes were adequately protected against surface erosion by vegetation. The crest was protected by a gravel road and vegetation. The seepage observed, in its current condition, is not felt to be sufficiently serious to constitute an unsafe condition. Nevertheless, the seepage should be monitored and any changes in quantity, location or color should be reported and investigated.

The shallow surface sloughing on the upstream slope appeared to have no significant effect on the overall structural stability of the embankment. Nevertheless, the damaged area should be repaired within a reasonable period of time to prevent continual sloughing or erosion of the slope. The minor erosion of the upstream slope due to wave action was not serious to constitute an unsafe condition. Nevertheless, the erosion should be monitored and if the erosion continues, steps should be taken to correct the problem.

Neither the principal spillway drop inlet nor the 24-inch reinforced concrete discharge pipe exhibited any evidence of misalignment or structural instability. The seepage observed at the outlet of the pipe is felt to have no

significant effect on the structural stability of the dam. Nevertheless, the seepage should be monitored and any changes in quantity or color should be reported and investigated. There are no signs of instability of the emergency spillway slopes.

The limestone formation is a sufficiently competent rock to serve as a foundation for a dam of this size and its spillway. Because of its karstic character leakage is likely under a dam founded on it, however, the grouting that was done after construction has apparently solved whatever problem existed and from a geologic standpoint, the dam appears sound.

b. Design and Construction Data

No design computations were uncovered during the report preparation phase. Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available. No embankment or foundation soil parameters are available for carrying out a conventional stability analysis on the embankment. No construction data or specifications relating to the degree of embankment compaction are available for use in a stability analysis.

c. Operating Records

No operating records are available relating to the stability of the dam or appurtenant structures. The water level on the day of the inspection was at the crest of the principal spillway and it is assumed that the reservoir remains close to full at all times. No regulated outlet works exist at the damsite except for the livestock watering system.

d. Post Construction Changes

According to Mr. Taylor, a grouting operation occurred two years after initial construction. The grout was used to try to stop seepage through the foundation. The seepage was stopped.

No other post construction changes were known to have been made which would affect the structural stability of the dam.

e. Seismic Stability

The dam is located in seismic Zone 1, as defined in Recommended Guidelines For Safety Inspection of Dams as prepared by the Corps of Engineers, and therefore, does not require a seismic stability analysis.

SECTION 7: ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment

The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

It should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is also important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that an unsafe condition could be detected.

a. Safety

The spillway capacity of Russell Taylor Dam was found to be "Inadequate". The spillway/reservoir system will accomodate about 71 percent of the PMF without overtopping the dam. Nevertheless, the spilllway and reservoir will accomodate the 100-year flood without overtopping the dam.

The dam embankment appears to be in satisfactory structural condition. The minor erosion due to wave action on the upstream embankment slope is not serious at this time, however, the condition should be monitored and repaired as required. The shallow surface sloughing on the upstream slope does not jeopardize the safety of the dam structure at this time, however, it should be repaired within a reasonable period of time. No signs of distress were observed in the embankment or in the foundation.

The seepage located at the downstream toe near the right abutment could pose a potential danger to the safety of the embankment. It is recommended that a seepage and stability analyses be performed to determine the source of the seepage and the effect of the seepage on the stability of the embankment.

The debris in and around the area of the intake to the drop inlet poses a possible obstruction to the normal operation of the principal spillway and should be removed. The seepage through the conduit of the principal spillway does not jeopardize the safety of the embankment in its present condition but it should be monitored for any changes in quantity and color.

The trees and debris in the downstream channel of the principal spillway should be removed. The channel should be kept clean of trees and debris.

b. Adequacy of Information

The conclusions presented in this report are based on field measurements, the available engineering data, past performance and present condition of the dam. Information on the design hydrology, hydraulic design, and the operation and maintenance of the dam as well as seepage and stability analyses were not available. To supplement available data and allow for a more definite evaluation of the dam, it is recommended that the following programs be initiated:

1. Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams should be made and this inspection report made a matter of record.

2. Set up a maintenance schedule and log all visits to the dam for operation, repairs and maintenance.

3. Perform seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams".

c. Urgency

The remedial measures recommended in paragraph 7.2 should be accomplished within a reasonable period of time.

d. Necessity for Phase II Inspection

Based on results of the Phase I inspection, a Phase II inspection is not felt to be necessary.

7.2 Remedial Measures

Alternatives:

Spillway capacity and/or height of the dam should be increased to accomodate the PMF without overtopping the dam. The overtopping depth during the occurrence of the PMF stated elsewhere in this report is not the required or recommended increase in height of the dam.

O & M Procedures:

1. The following corrective measures should be undertaken within a reasonable period of time:

(a) Repair the shallow surface sloughing on upstream slope.

(b) Remove the debris from in and around the area of the intake to the drop inlet.

(c) Remove the trees and debris from the downstream channel of the principal spillway.

(d) Seepage and stability analyses should be performed by a professional engineer experienced in the design and construction of earthen dams.

2. The following conditions should be monitored:

(a) Monitor the seepage at the downstream toe and abutment contact located approximately 170 feet from the right abutment for changes in quantity, location or color, and report any changes.

(b) Monitor the seepage through the outlet conduit of the principal spillway for changes in quantity or color and report any changes.

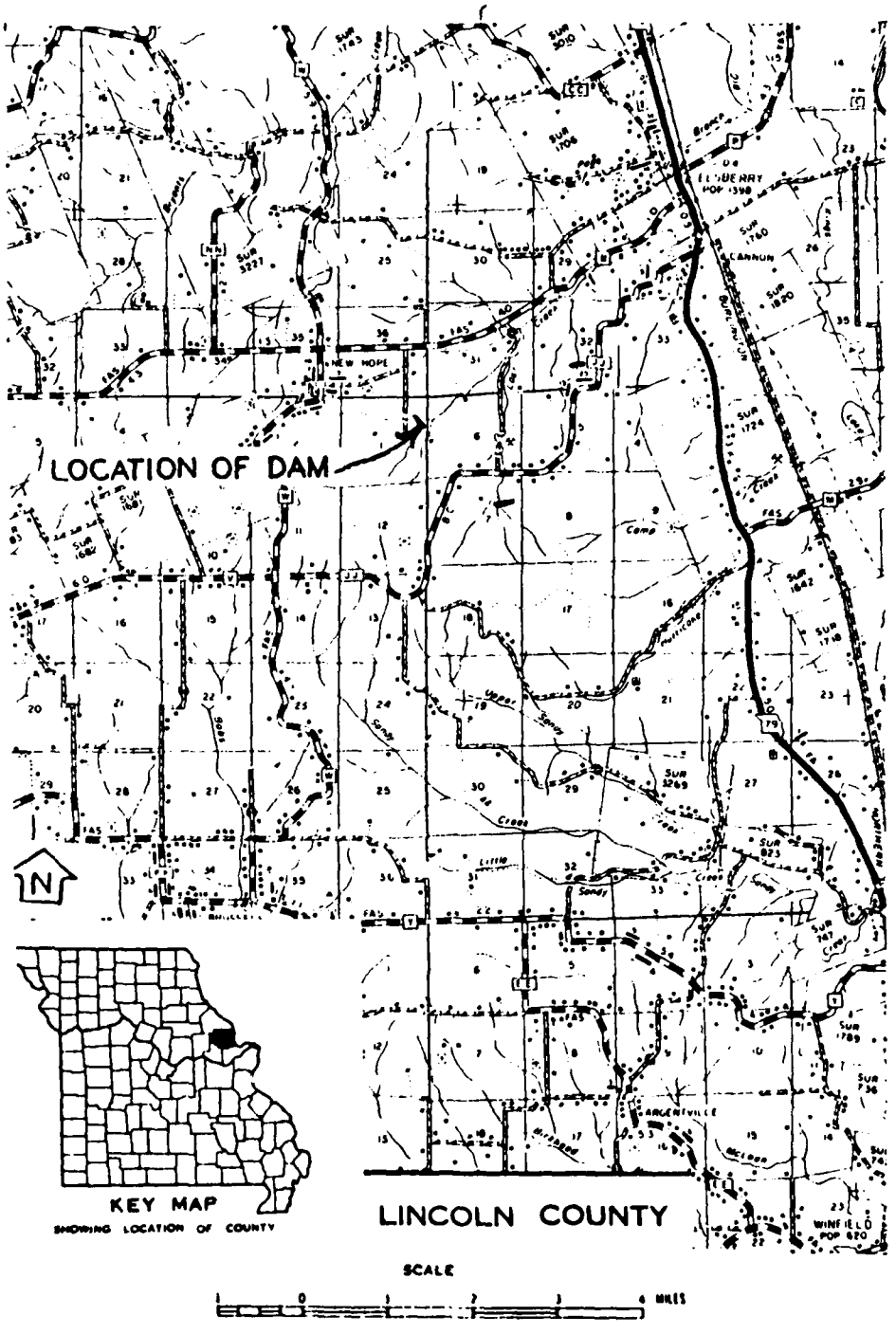
(c) Monitor the erosion due to wave action on the upstream slope and if the erosion continues make corrective repairs.

3. The owner should initiate the following programs:

(a) Periodic inspection of the dam by a professional engineer experienced in the design and construction of earthen dams.

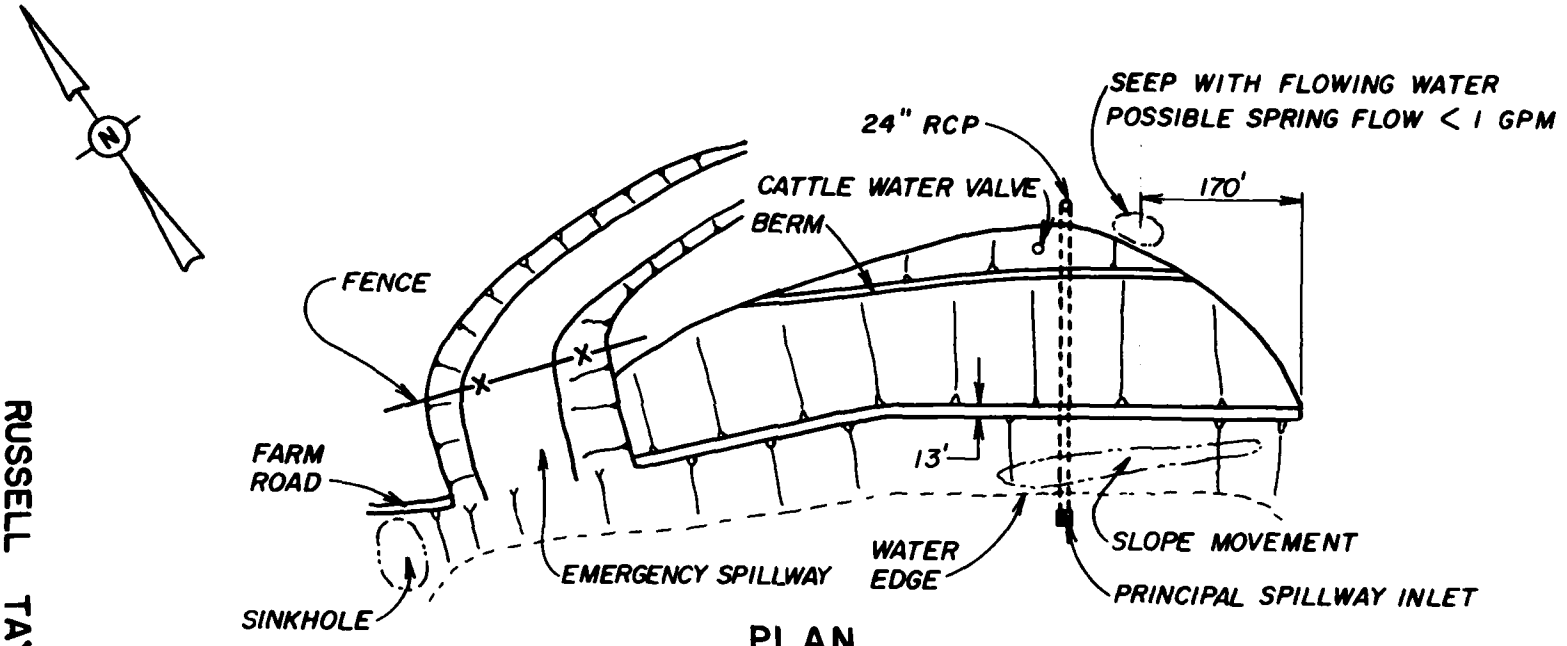
(b) Set up a maintenance schedule and log all visits to the dam for operation, repairs and maintenance.

PLATES

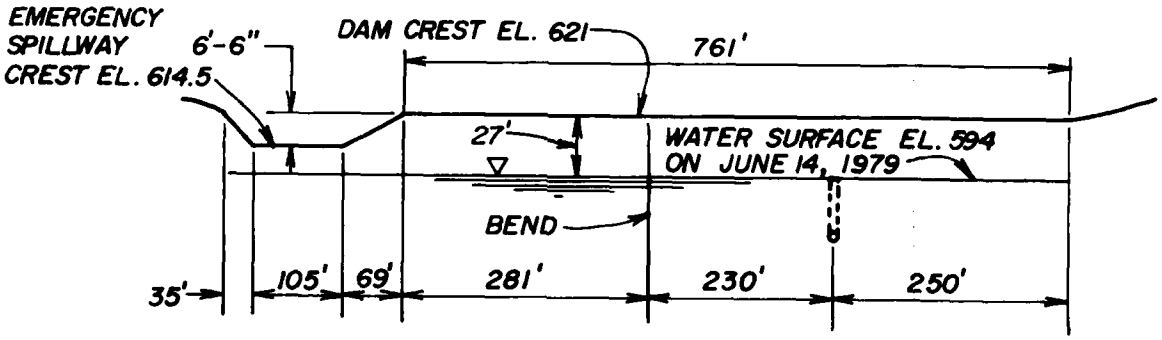


LOCATION MAP - RUSSELL TAYLOR DAM

RUSSELL TAYLOR DAM (MO. 10216)
PLAN & ELEVATION



PLAN



ELEVATION

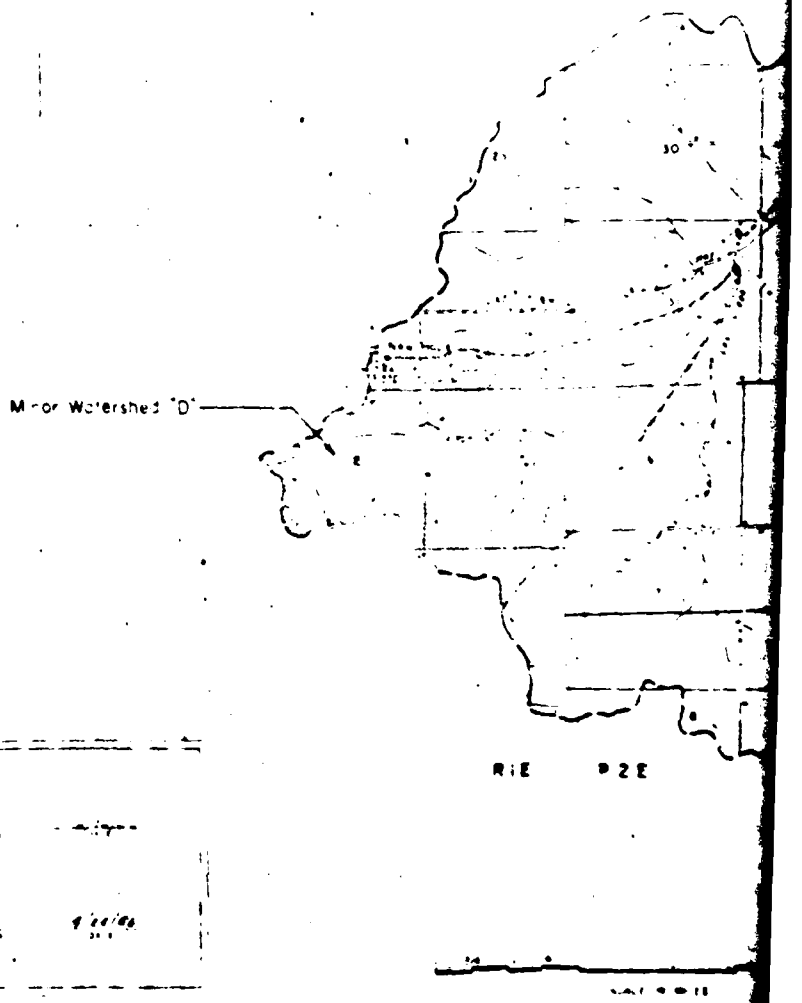
SCALE
1" = 200' (HORIZONTAL)
VERTICAL (NOT TO SCALE)

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DETAILED PLANS FOR
LOST CREEK WATERSHED PROJECT

THE SOIL CONSERVATION DISTRICT OF LINCOLN COUNTY

SHEET 1 OF
MINOR WATERSHED



APPROVED BY

APPROVED BY

C. E. Thomas

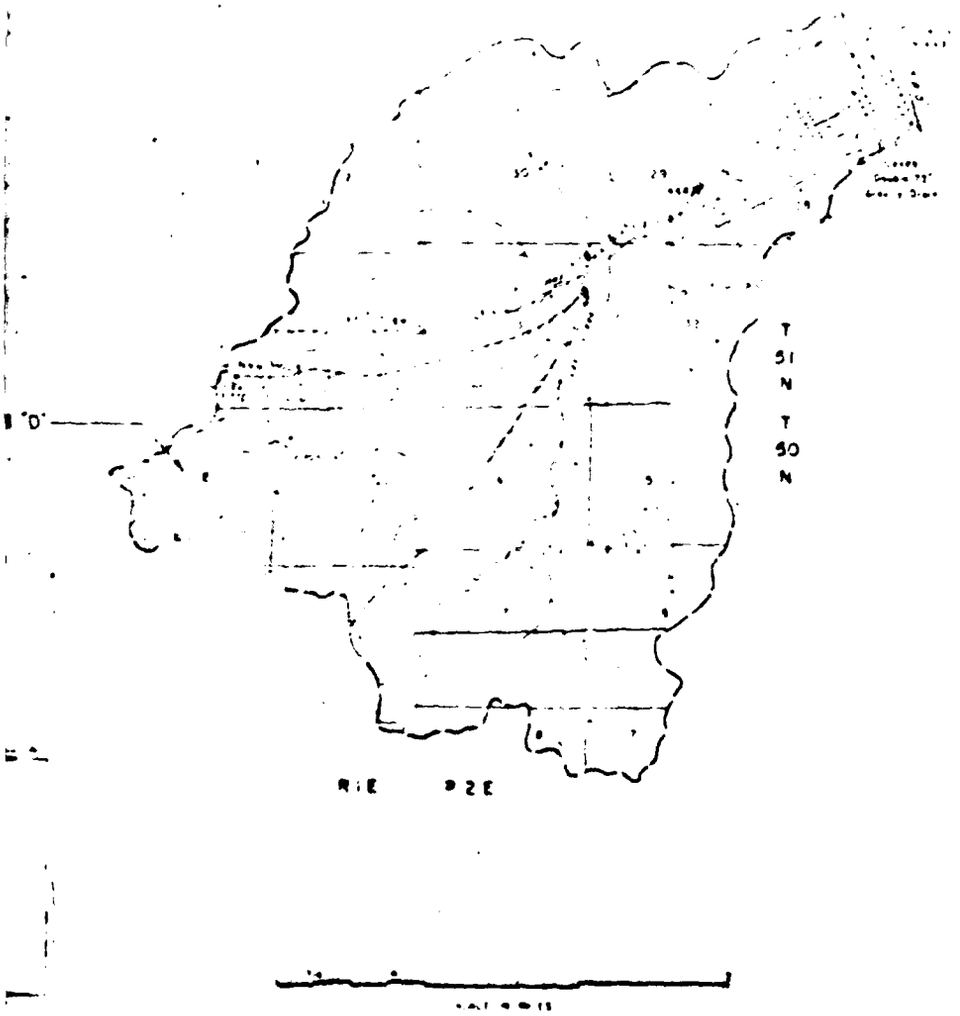
DETAIL PLANS FOR

LOST CREEK WATERSHED PROTECTION PROJECT

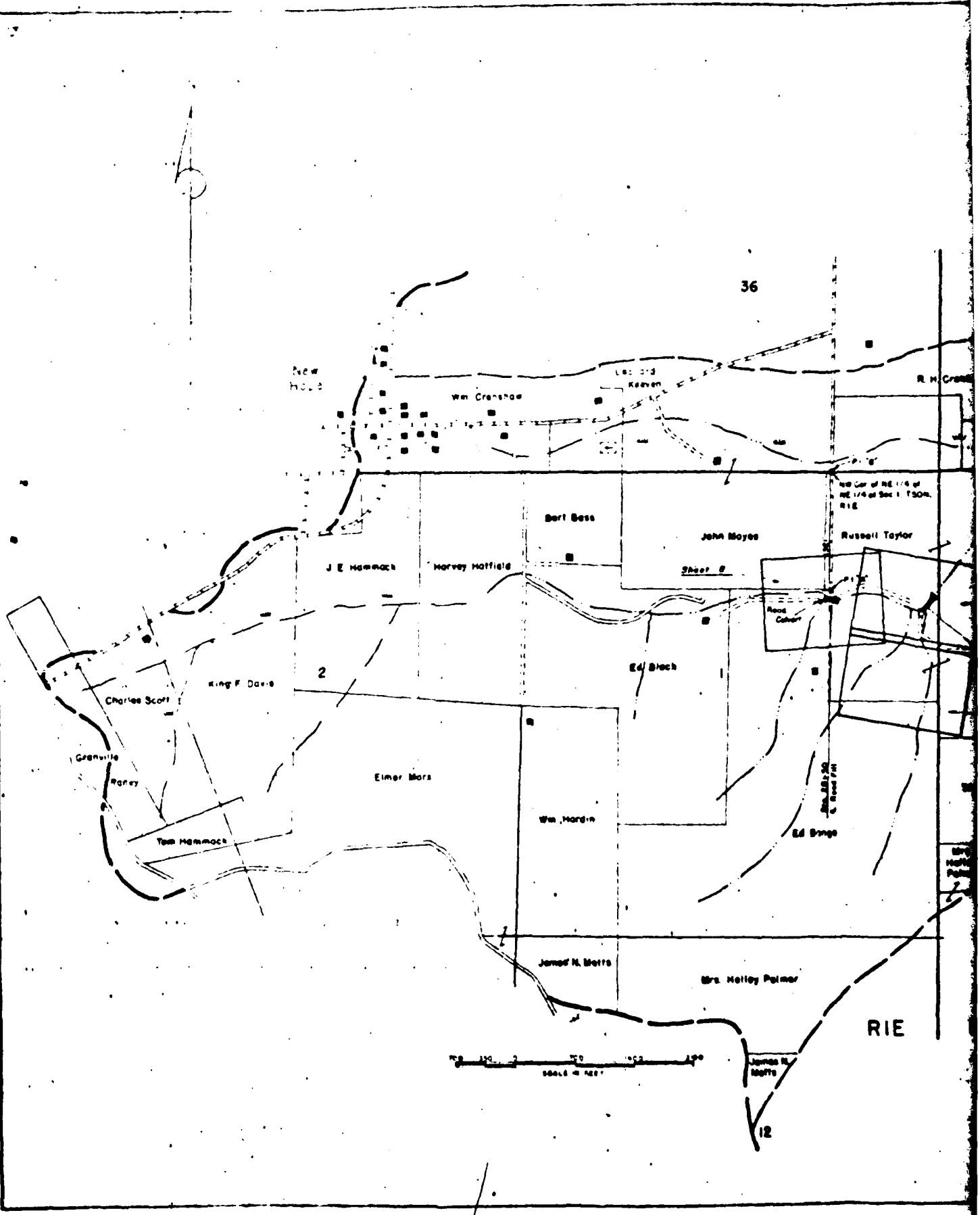
THE SOUTHEAST PART OF LINCOLN COUNTY, MISSOURI

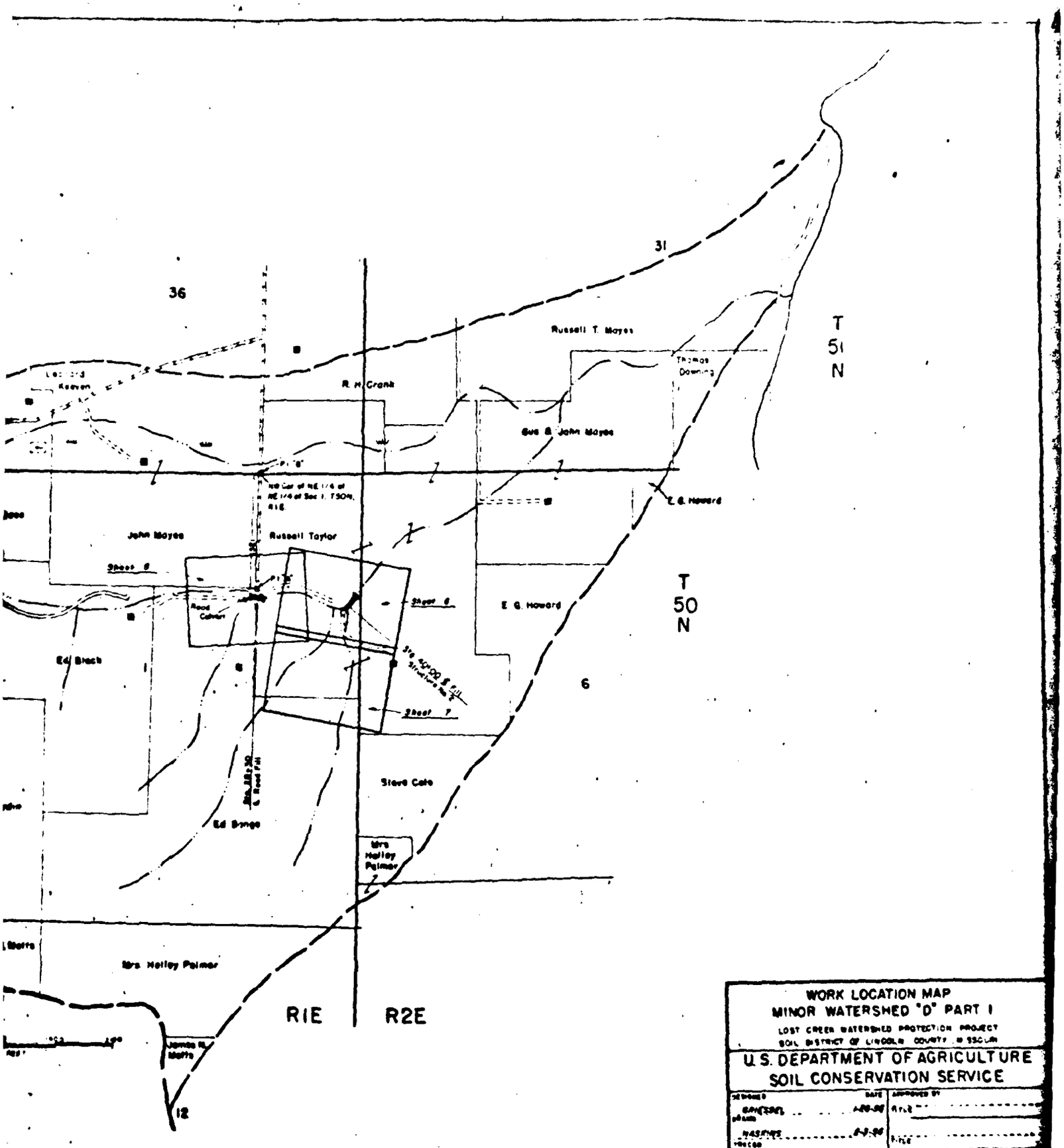
PART I OF

MINOR WATERSHED "D"



LOCATION IN MISSOURI

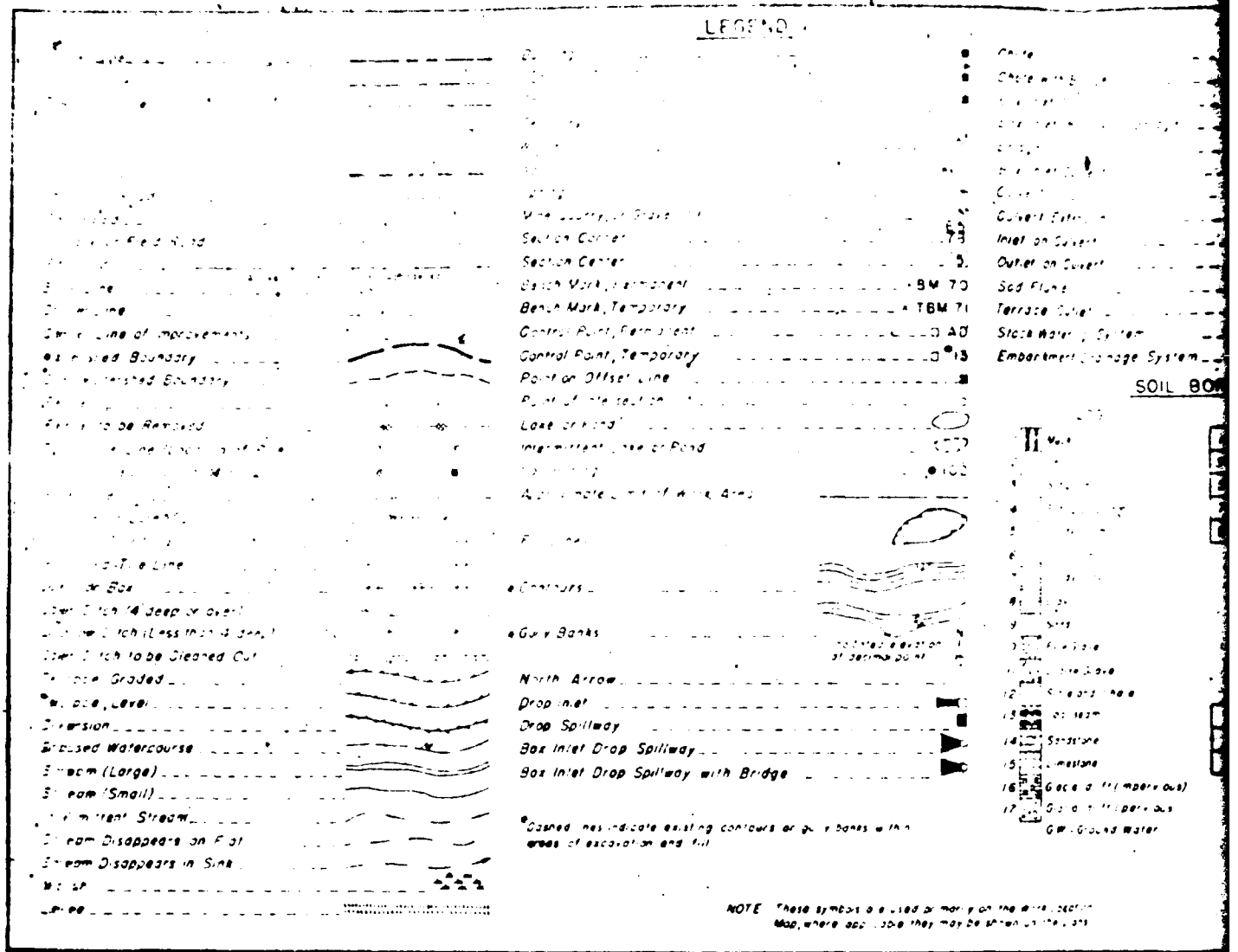

36
New House
Wm Crenshaw
Leonard Keaven
R. H. Crenshaw
Bert Bass
John Moyes
Russell Taylor
J E Hammack
Harvey Hatfield
Sheet 8
Road Culvert
Ed Black
King F. Davis
Charles Scott
2
1
Granville
Raney
Elmer Mars
Wm. Hardin
Ed Bingo
Tom Hammack
James N. Watts
Mrs. Holley Palmer
RIE
12

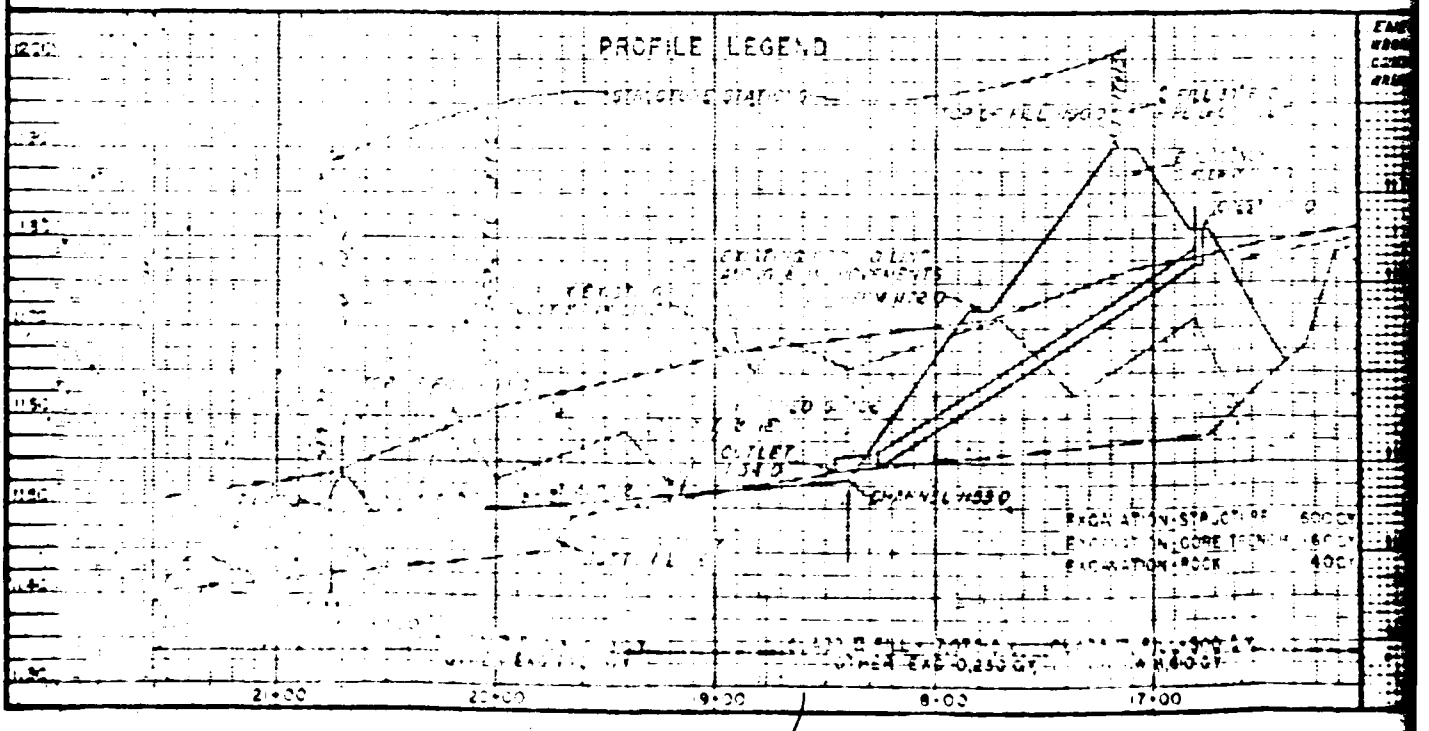


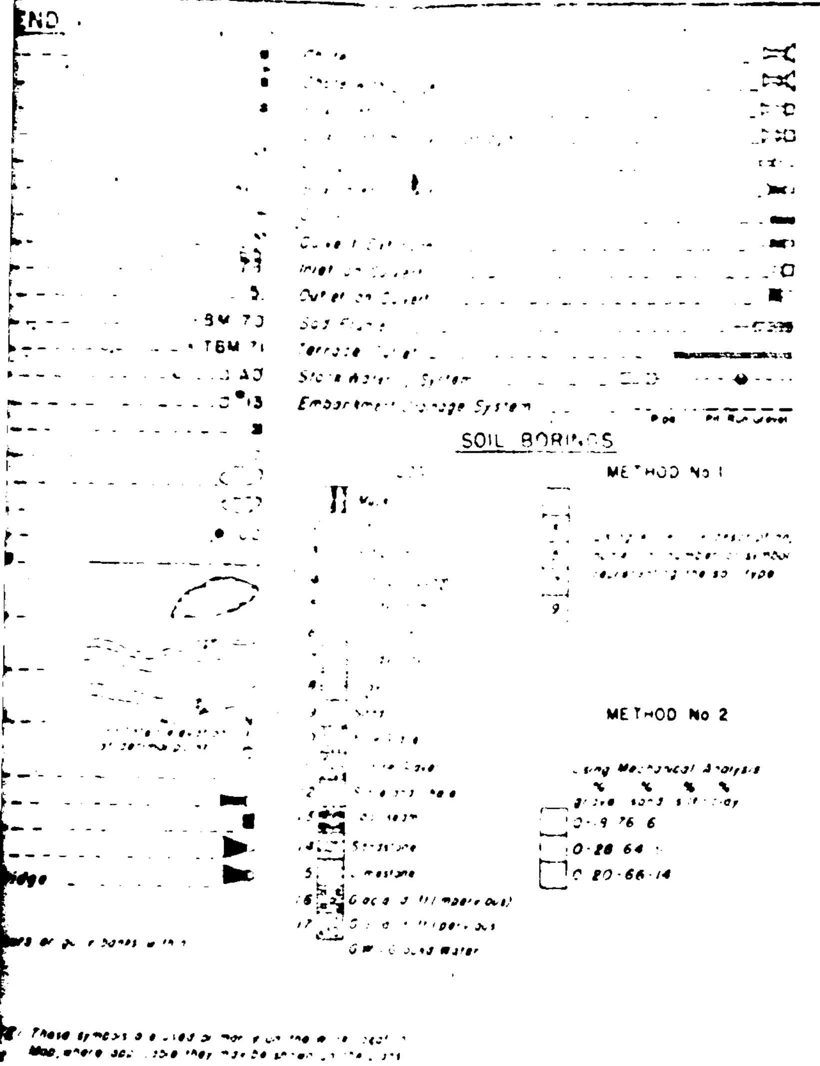
WORK LOCATION MAP
MINOR WATERSHED "D" PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL DISTRICT OF LINCOLN COUNTY, OKLAHOMA

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

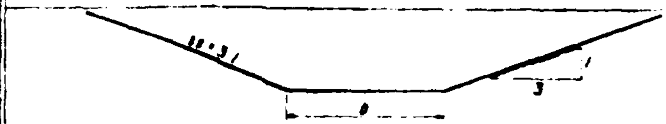
DESIGNED	DATE	APPROVED BY
DRAWING	4-20-82	TITLE
TRACED	5-3-82	TITLE
CHECKED	5-3-82	SHEET NO. 2 OF 28 SHEETS


LEGEND
Section Corner
Section Corner
Bench Mark, Temporary
Control Point, Temporary
Point on Offset Line
Contours
Guy Banks
North Arrow
Drop Inlet
Drop Spillway
Box Inlet Drop Spillway
Box Inlet Drop Spillway with Bridge
Culvert
Inlet on Culvert
Outlet on Culvert
Sod Flume
Terrace Outlet
Stock Water Pipeline
Embankment Drainage System
SOIL BO
Limestone
Gravel (Impervious)
Gravel (Pervious)
GW-Ground Water
NOTE These symbols are used on many of the drainage plan sheets

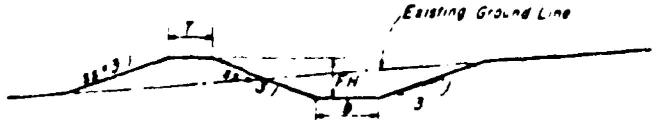

PROFILE LEGEND
2+00
10+00
9+00
8+00
17+00



TYPICAL CROSS SECTIONS



IMPROVED DRAINAGEWAYS
CHANNELS, GRADED WATERCOURSES, SOD FLUMES, ETC



DIVERSIONS & EMERGENCY SPILLWAYS

DEFINITIONS OF TERMS

s - Grade of channel in feet of drop per foot of length
b - Bottom width of channel in feet
ss - Side slope ratio, horizontal to vertical
T - Top width of dike, levee or fill in feet
FH - Fill height of dike in feet (vertical distance from bottom of channel to top of dike)

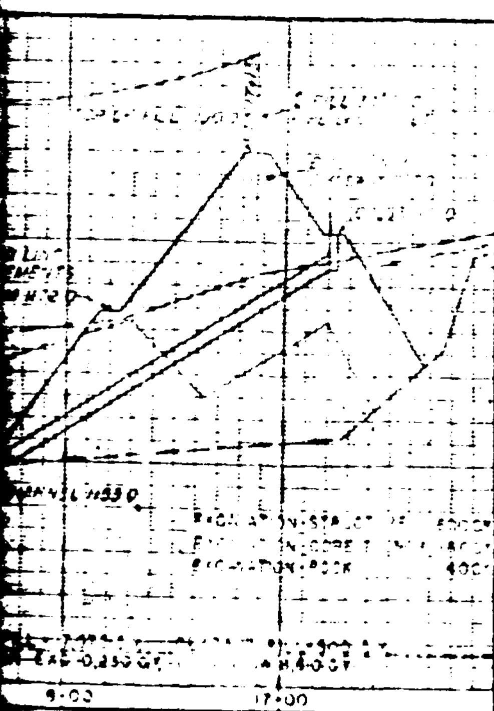
TABLE OF STANDARD DIMENSIONS

IMPROVEMENT	T	ss
Improved Drainageways	-	3/
Diversions	6'	3/
Levees	6'	3/ or As shown on plans
Drop Inlet Embankments	10'	3/ or As shown on plans
Chute Embankments	6'	3/ or As shown on plans
Drop Spillway Embankments	6'	3/ Upstream - 2/ Downstream

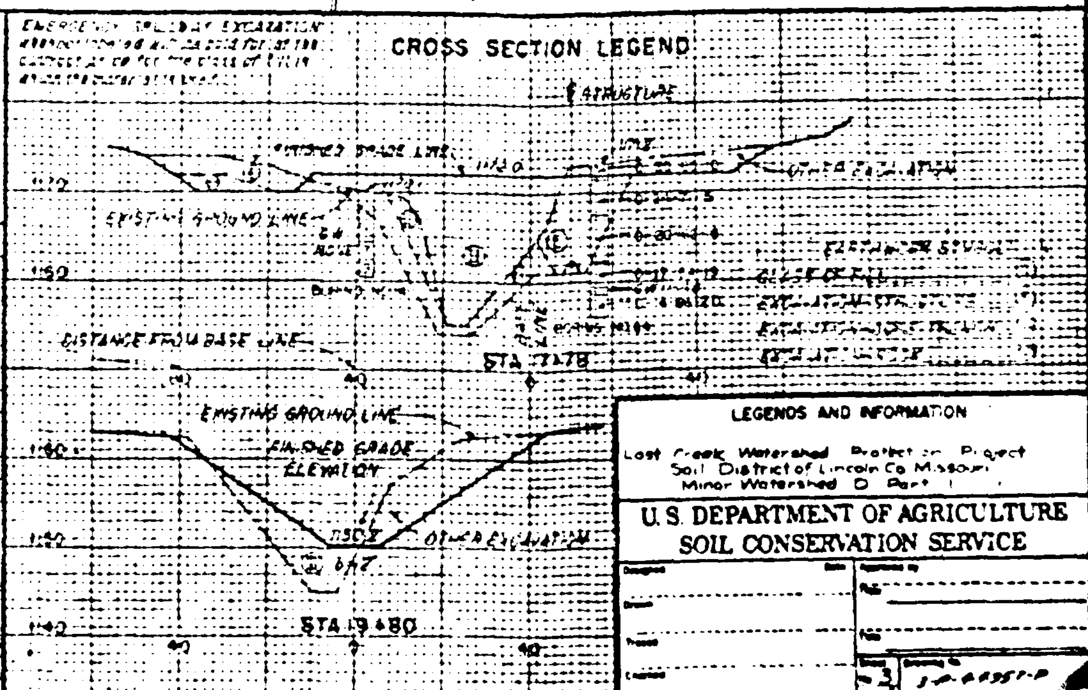
NOTE
1 Use standard dimensions unless otherwise shown on plans
2 Use s, b, and FH as shown on plans

GENERAL NOTES

℄ improvements are along Base Line unless otherwise indicated
Elevations of pipes refer to invert elevations
Cross sections shown as looking downstream
Lines showing limits of structure excavation are on a 1:1 slope unless otherwise indicated



CROSS SECTION LEGEND

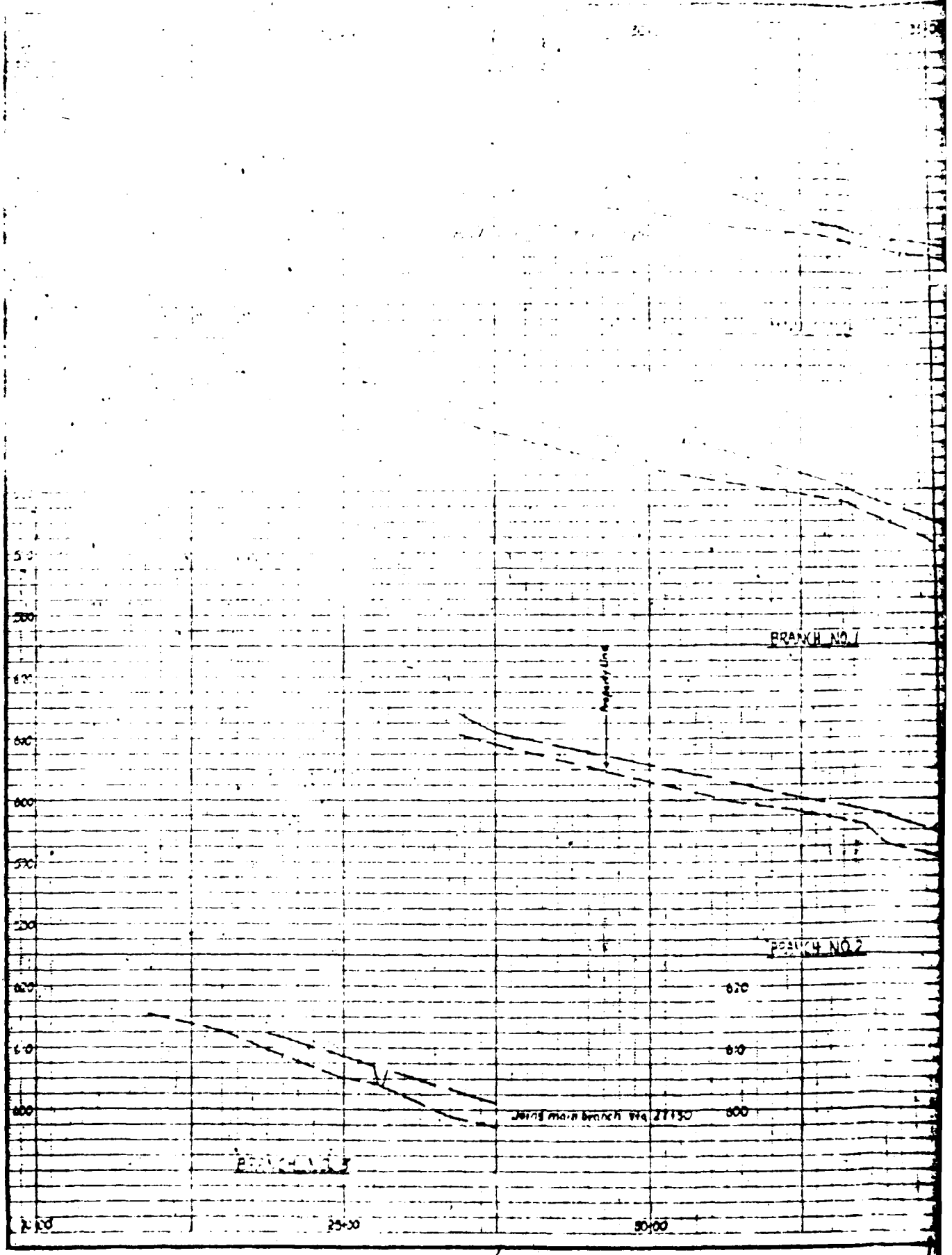


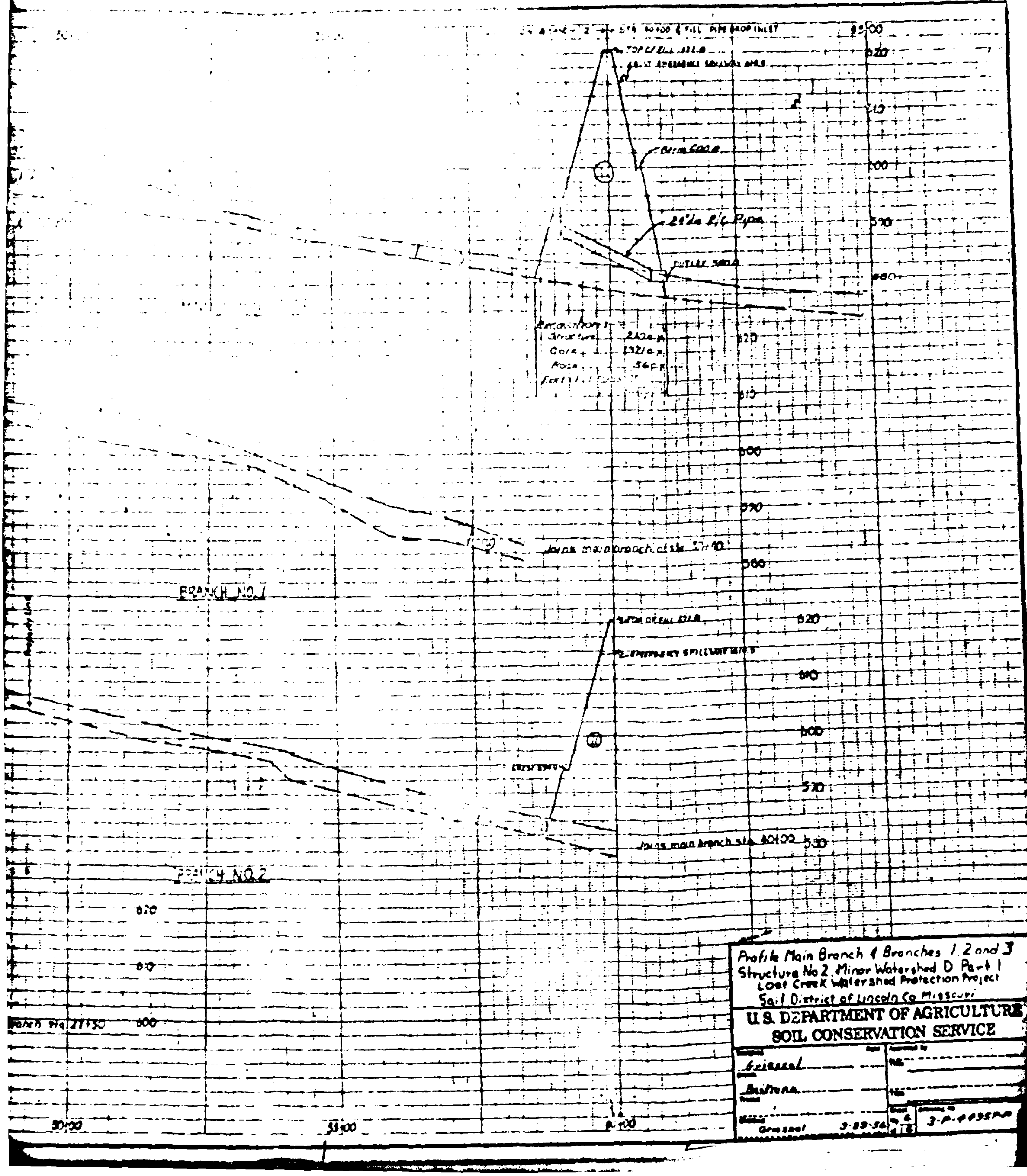
LEGENDS AND INFORMATION

Lost Creek Watershed Protection Project
Soil District of Lincoln Co. Missouri
Minor Watershed D Part 1

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
Drawn		Title
Traced		Title
Checked		Sheet 3 / Drawing No. 7-P-44957-P

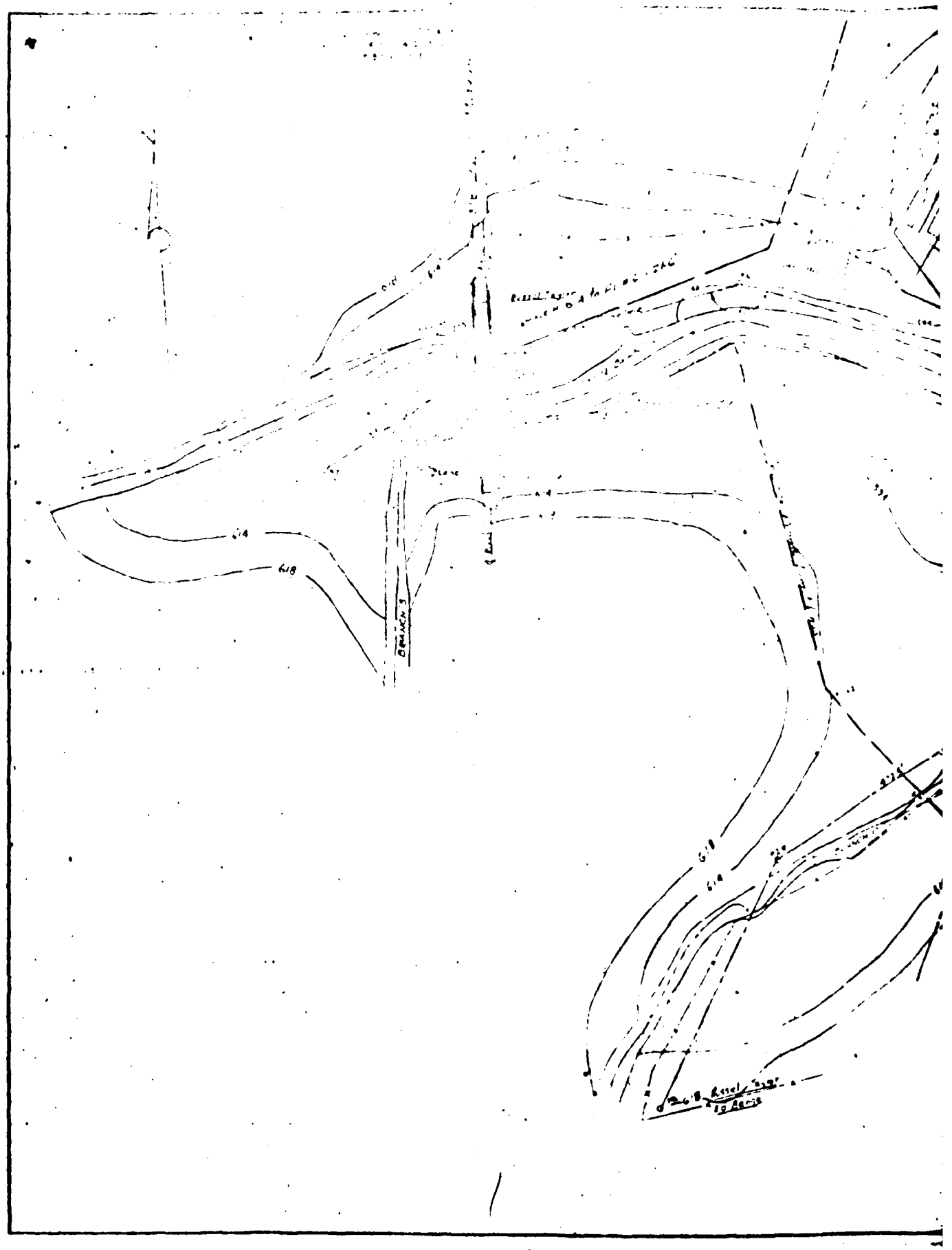

BRANCH NO.1
Property Line
BRANCH NO.2
Joins main branch at 27130
25+00
30+00

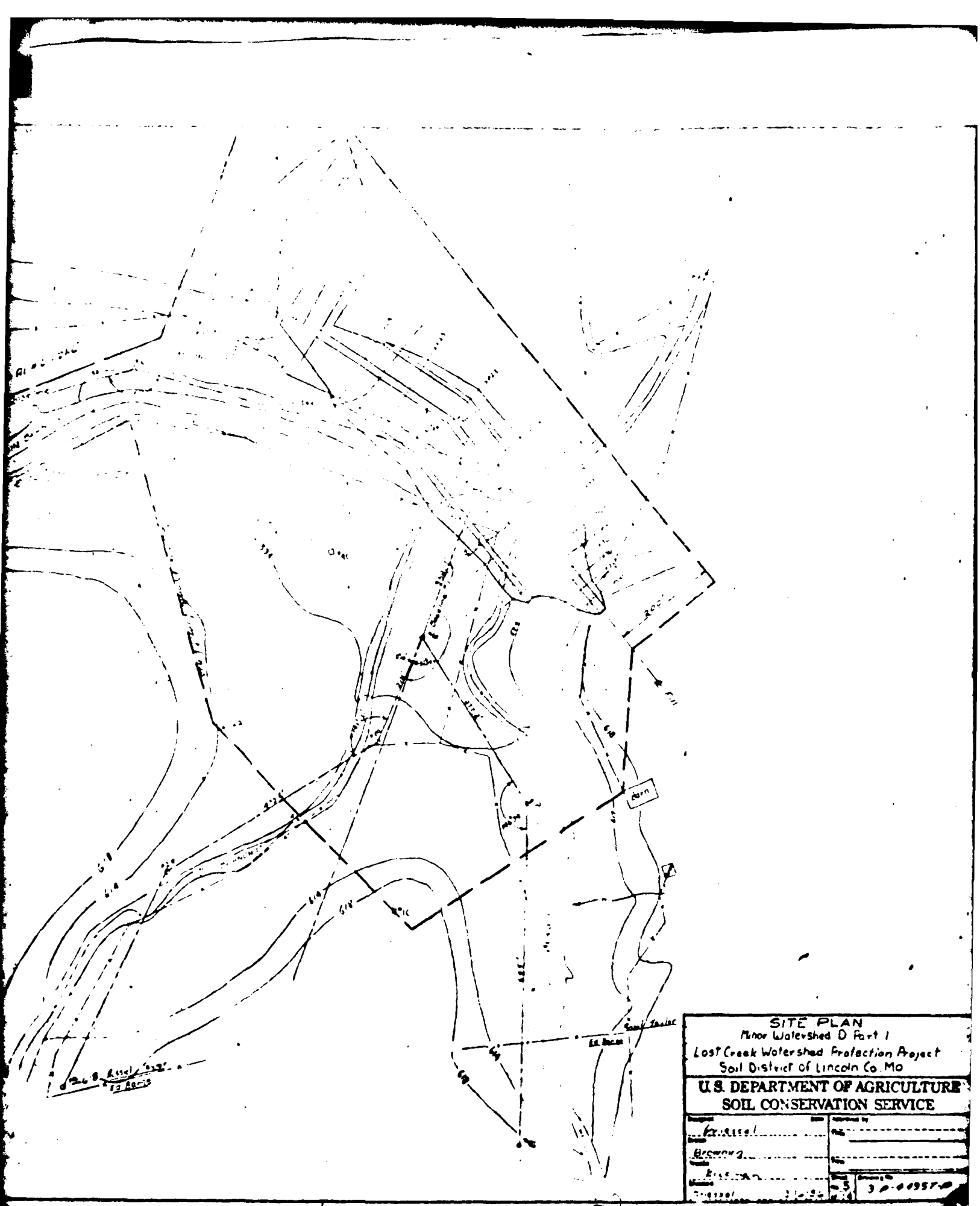


Profile Main Branch & Branches 1, 2 and 3
Structure No. 2, Minor Watershed D Part 1
Lost Creek Watershed Protection Project
Soil District of Lincoln Co. Missouri

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

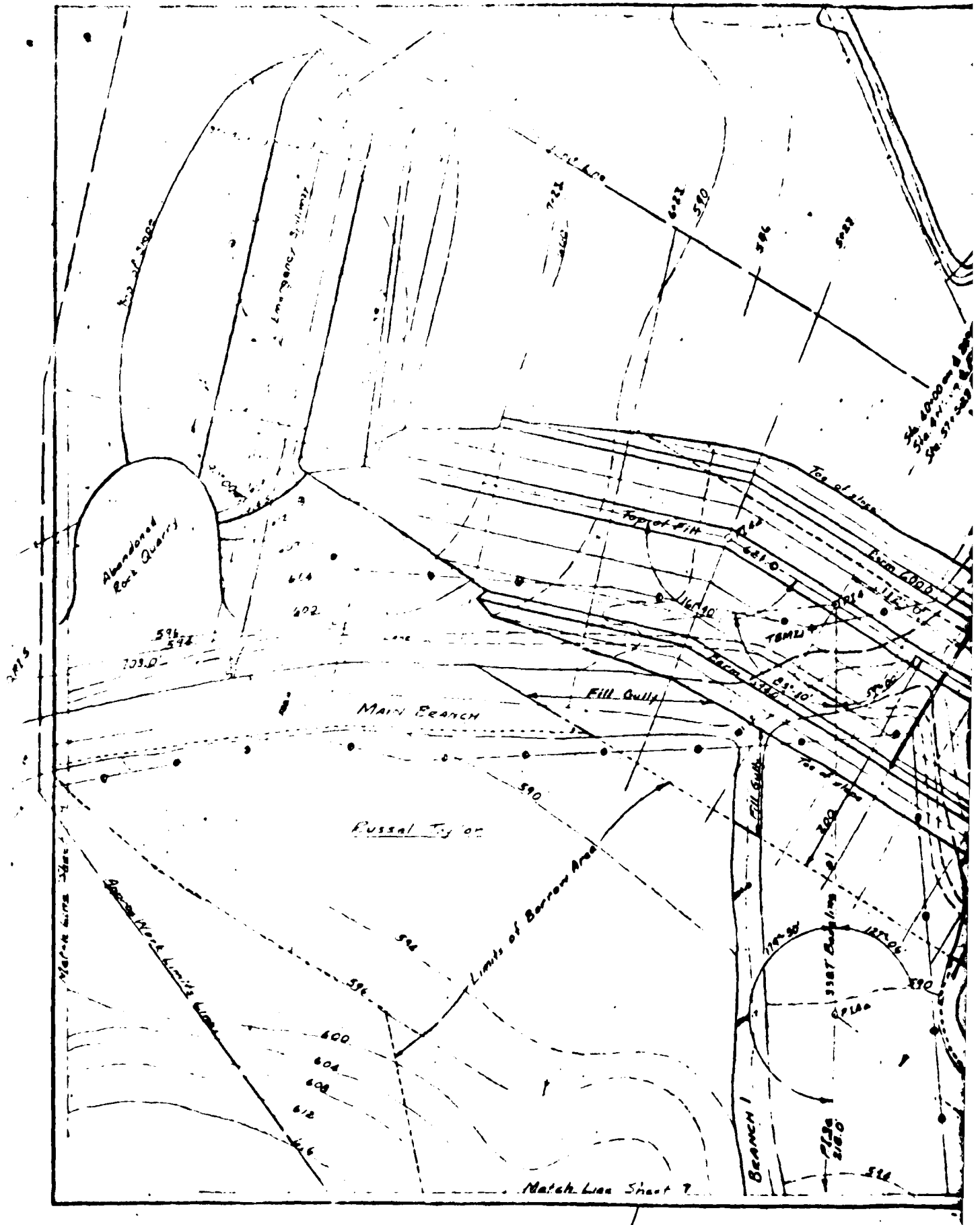
Designed: Grissel
Drawn: Brittona
Checked: Grossel 3-23-56
Sheet 4 of 18
Drawing No. 3-P-4495PA

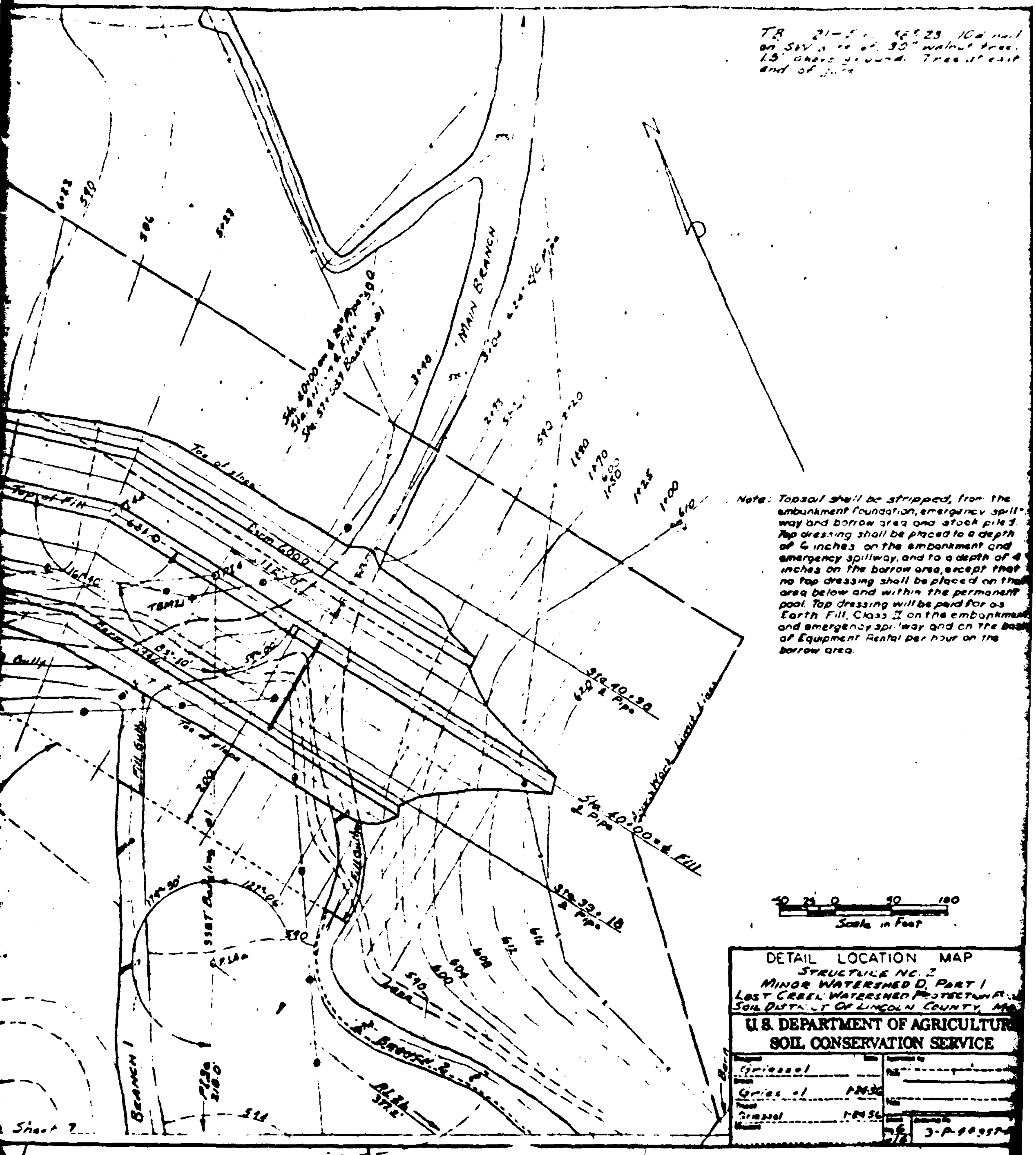

618
618
618
618
DRAIN 3

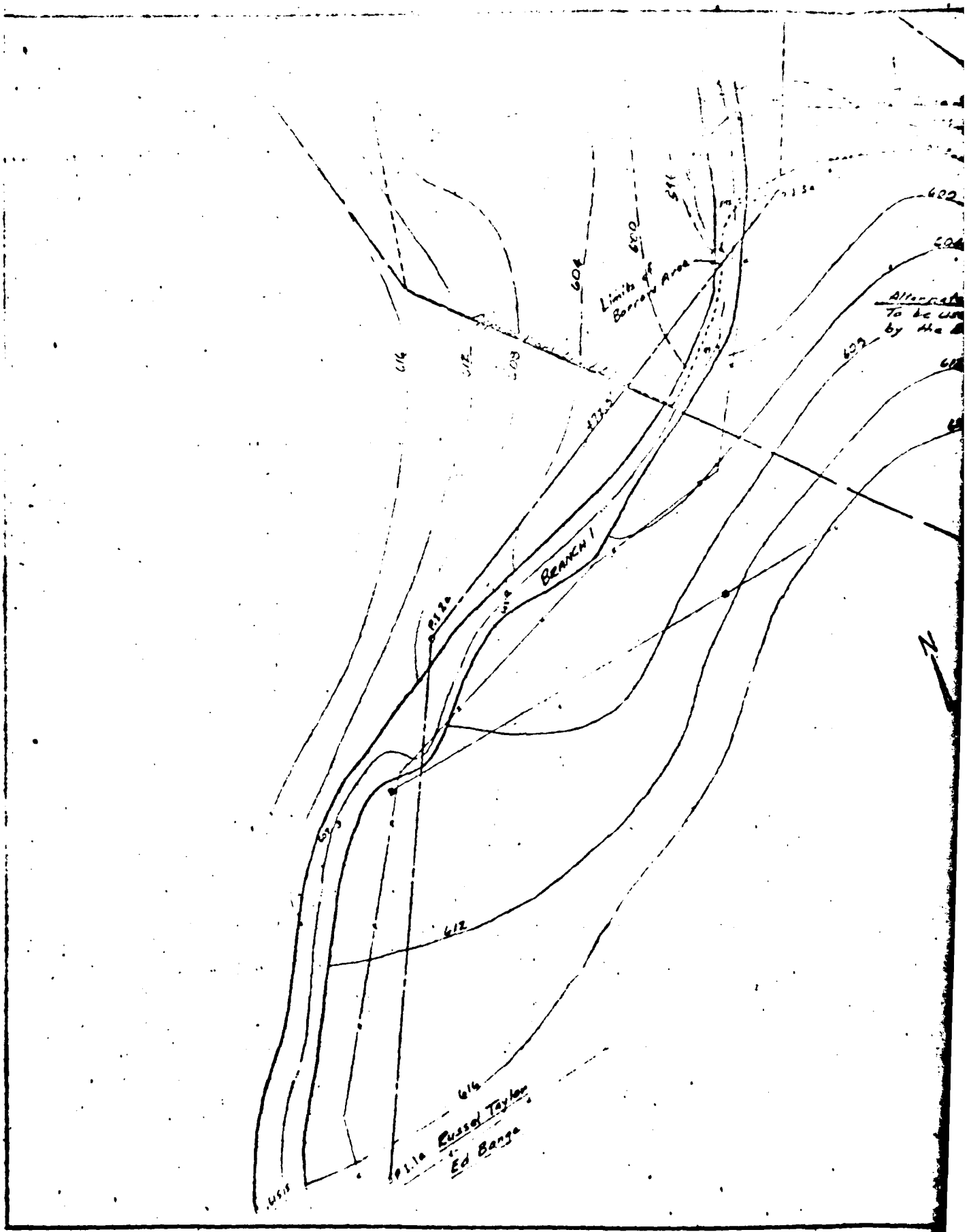


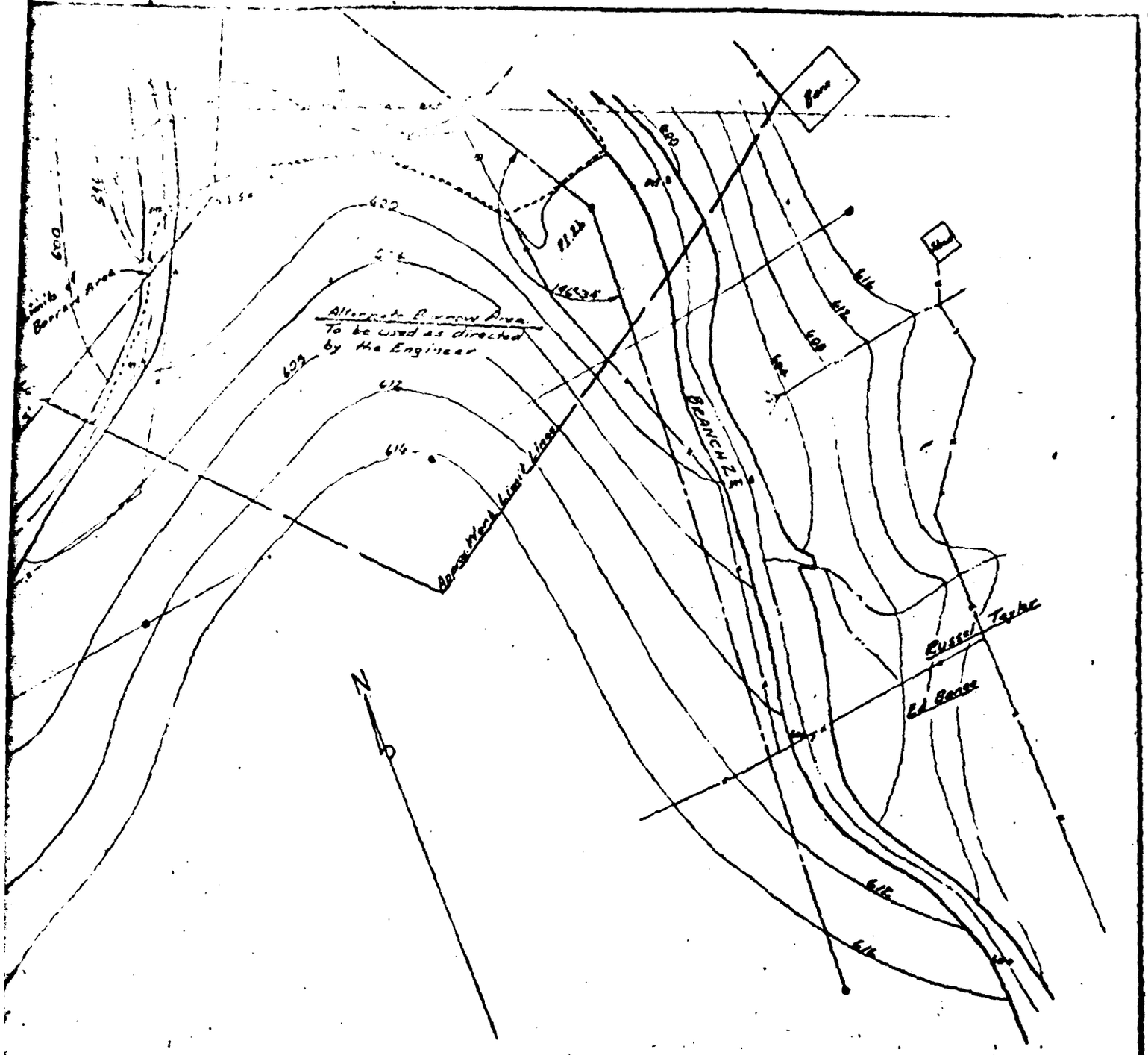
SITE PLAN
Minor Watershed D Part I
Lost Creek Watershed Protection Project
Soil District of Lincoln Co. MO

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE


Abandoned Rock Quarry
MAIN BRANCH
Fill Gully
Limits of Borrow Area
Top of Slope
Top of Fill
Match Line Sheet 7
BRANCH 1


MAIN BRANCH
Top of Fill
Toe of slope
Berm 600.0
Berm
Gully
Fill Gully
BRANCH 1
Branch 2
Scale in Feet
Note: Topsoil shall be stripped, from the embankment foundation, emergency spillway and borrow area and stock piled. Top dressing shall be placed to a depth of 6 inches on the embankment and emergency spillway, and to a depth of 4 inches on the borrow area, except that no top dressing shall be placed on that area below and within the permanent pool. Top dressing will be paid for as Earth Fill, Class II on the embankment and emergency spillway and on the basis of Equipment Rental per hour on the borrow area.
DETAIL LOCATION MAP
STRUCTURE NO. 2
MINOR WATERSHED D, PART 1
LOST CREEK WATERSHED PROTECTION
SOIL DISTRICT OF LINCOLN COUNTY
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Sheet 7

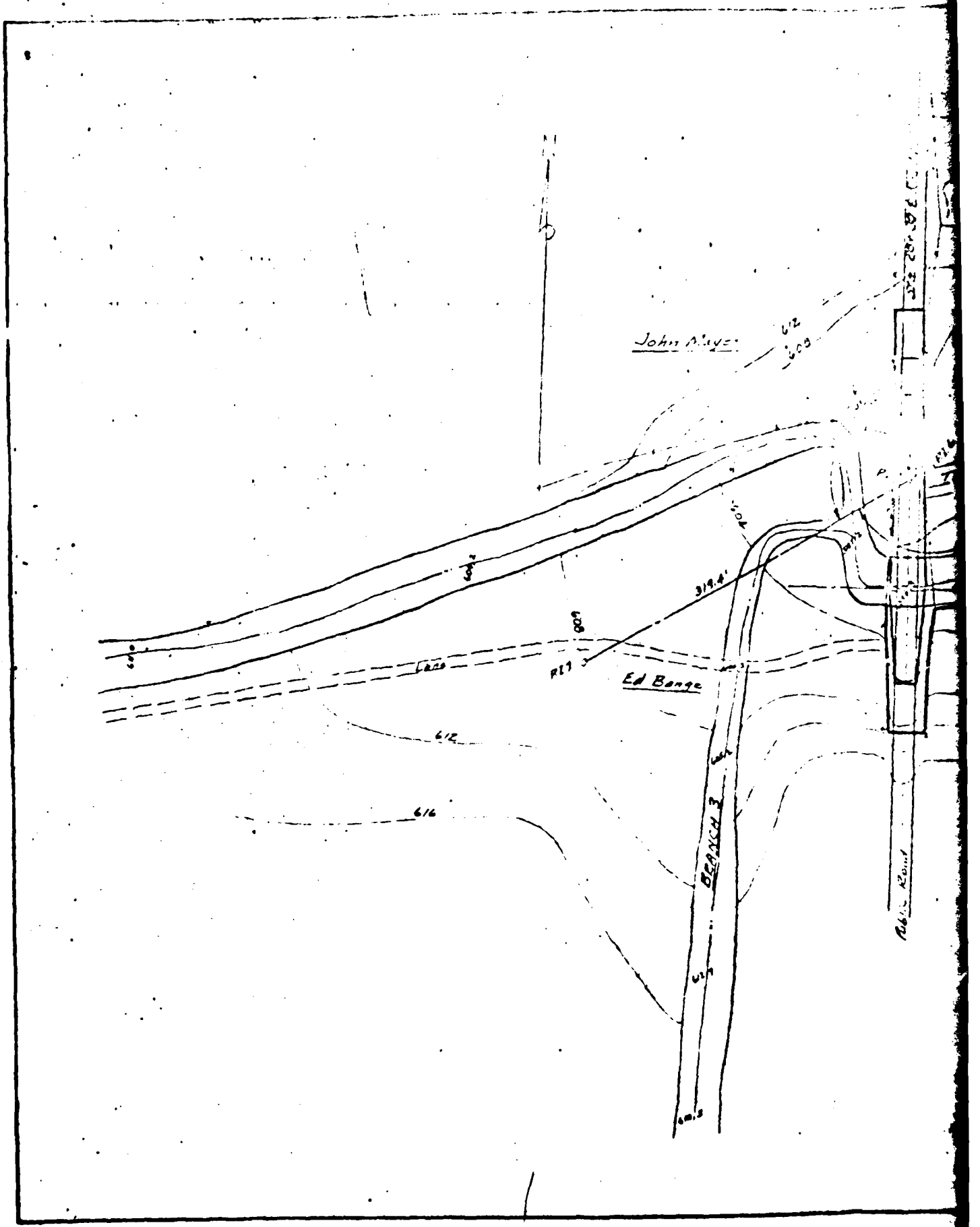

Limits of Borrow Area
BRANCH
N

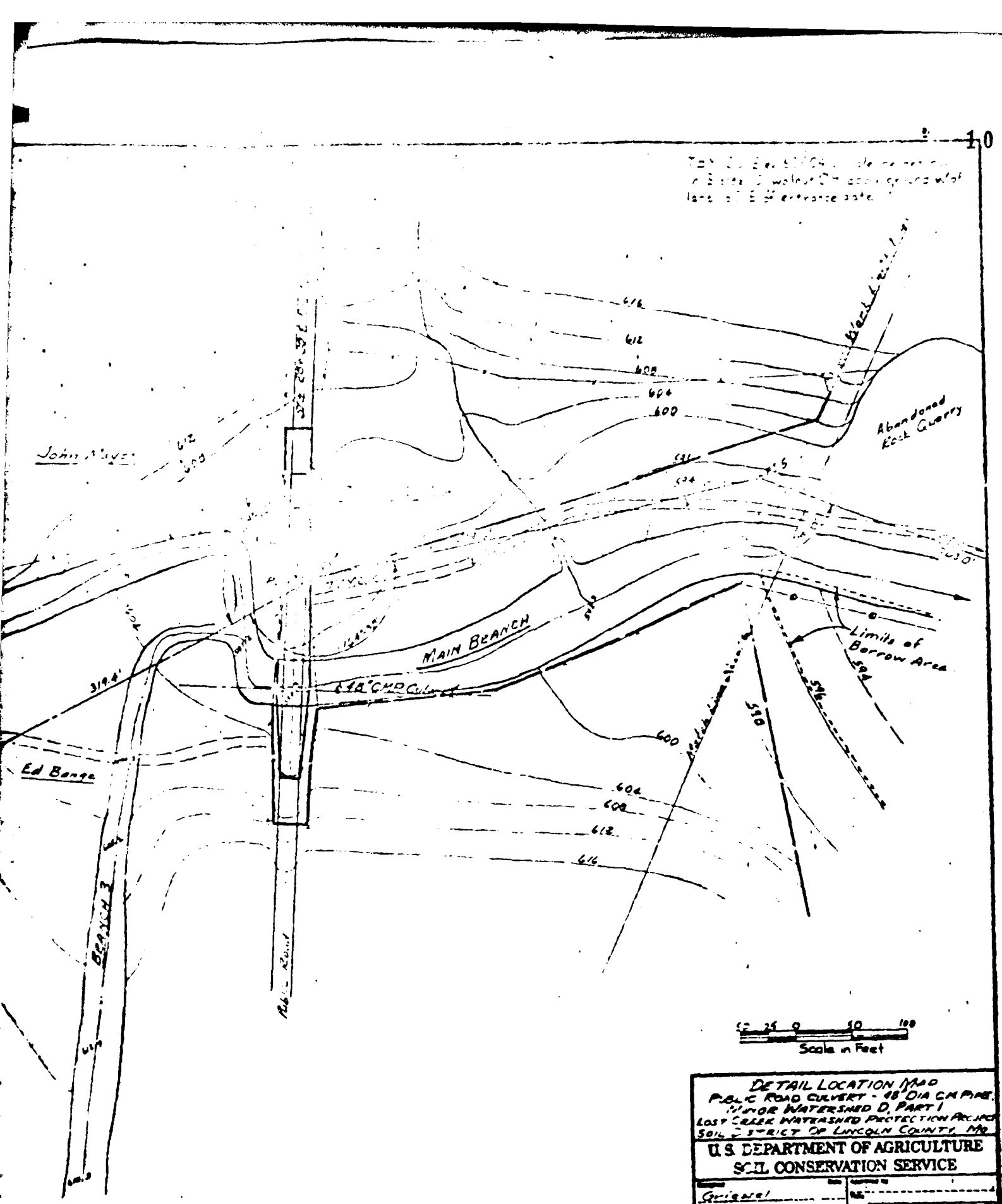


DETAIL LOCATION MAP
STRUCTURE No. 2
MINOR WATERSHED D, PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL DISTRICT OF LINCOLN COUNTY, MO.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Original	
Original	
Original	


John Mayer
612
609
319.4'
609
Ed Benge
612
616
Branch 3

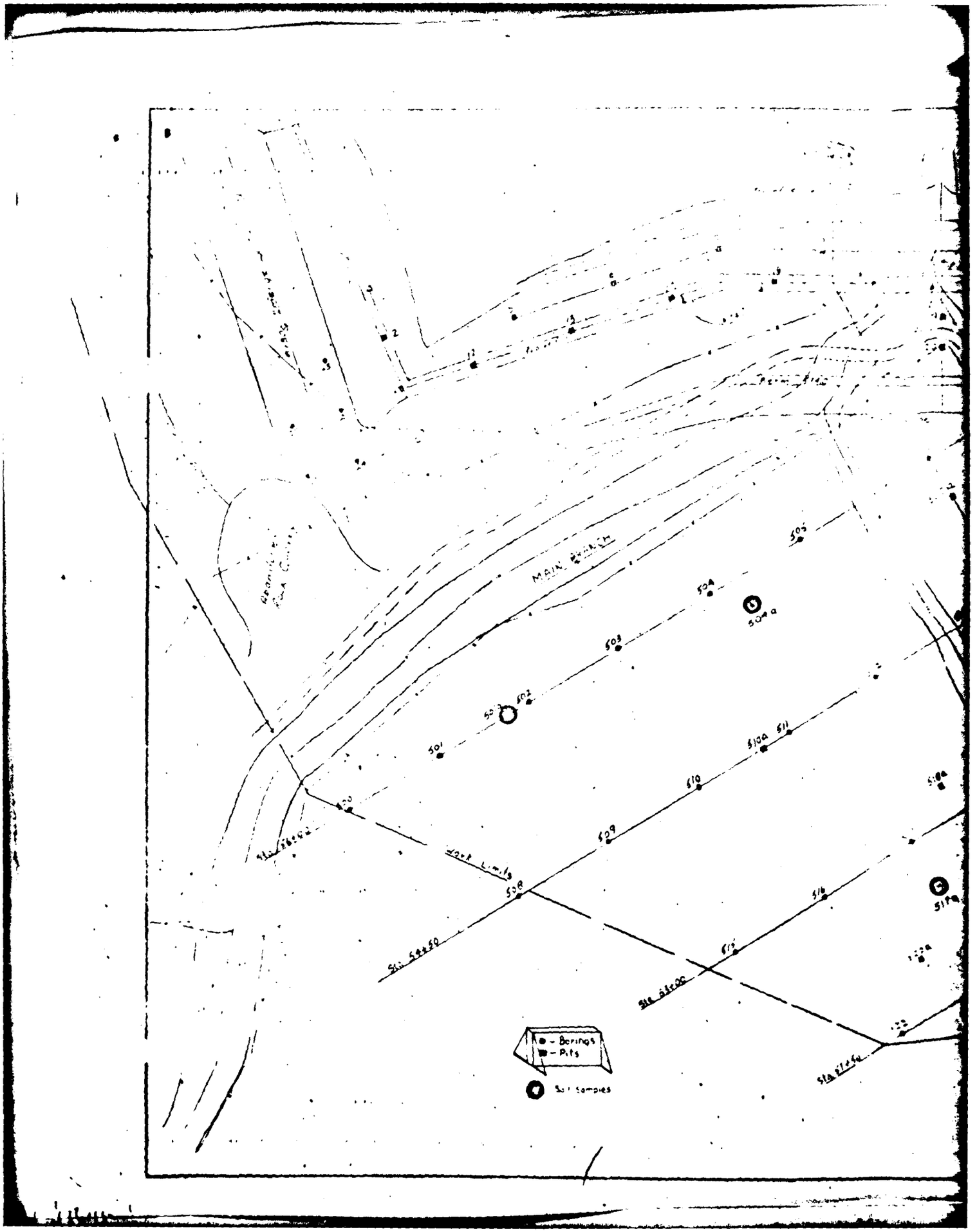


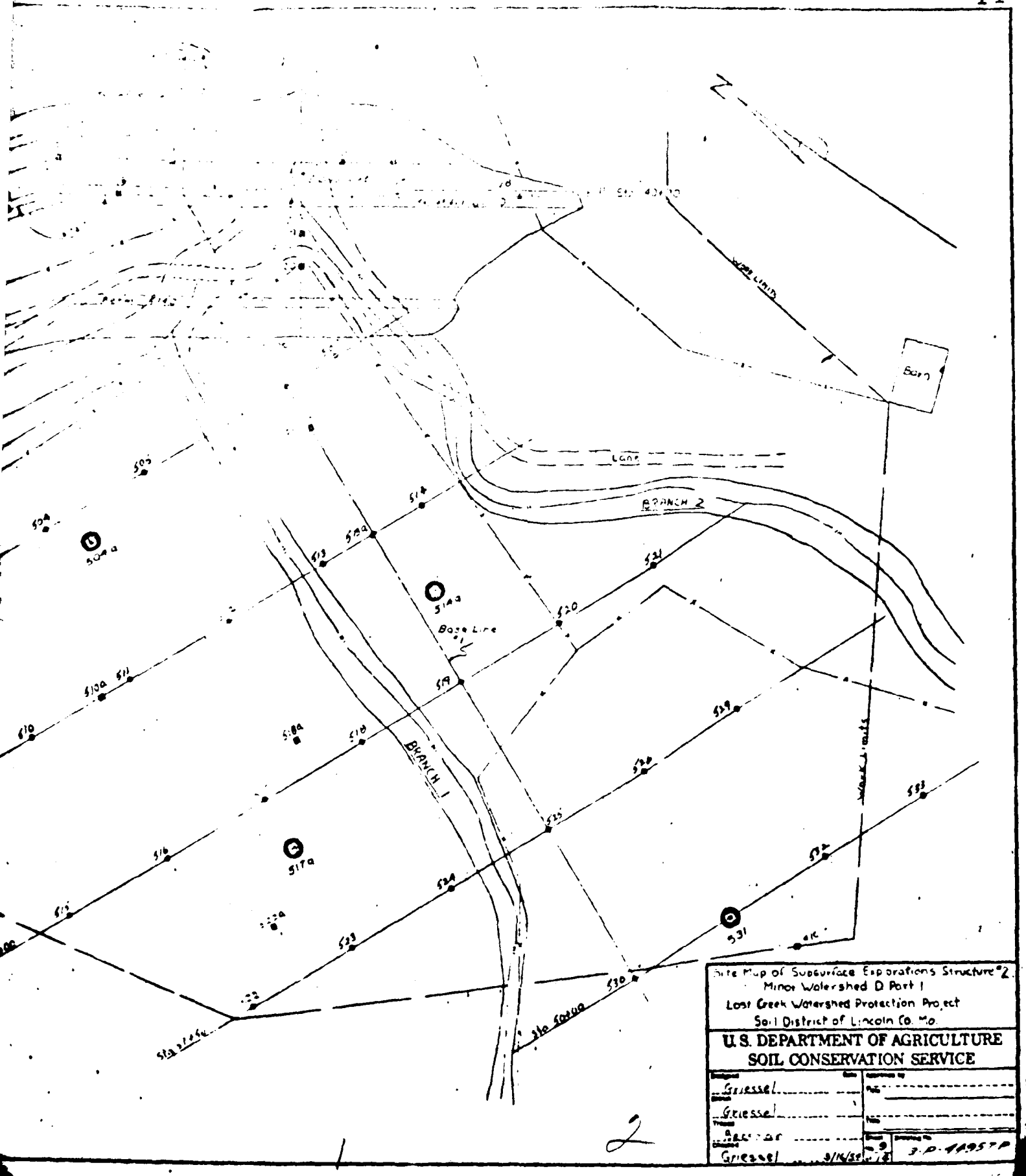
DETAIL LOCATION MAP
PUBLIC ROAD CULVERT - 48" DIA CM PIPE
MINOR WATERSHED D, PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL CONSERVATION DISTRICT OF LINCOLN COUNTY, MO.

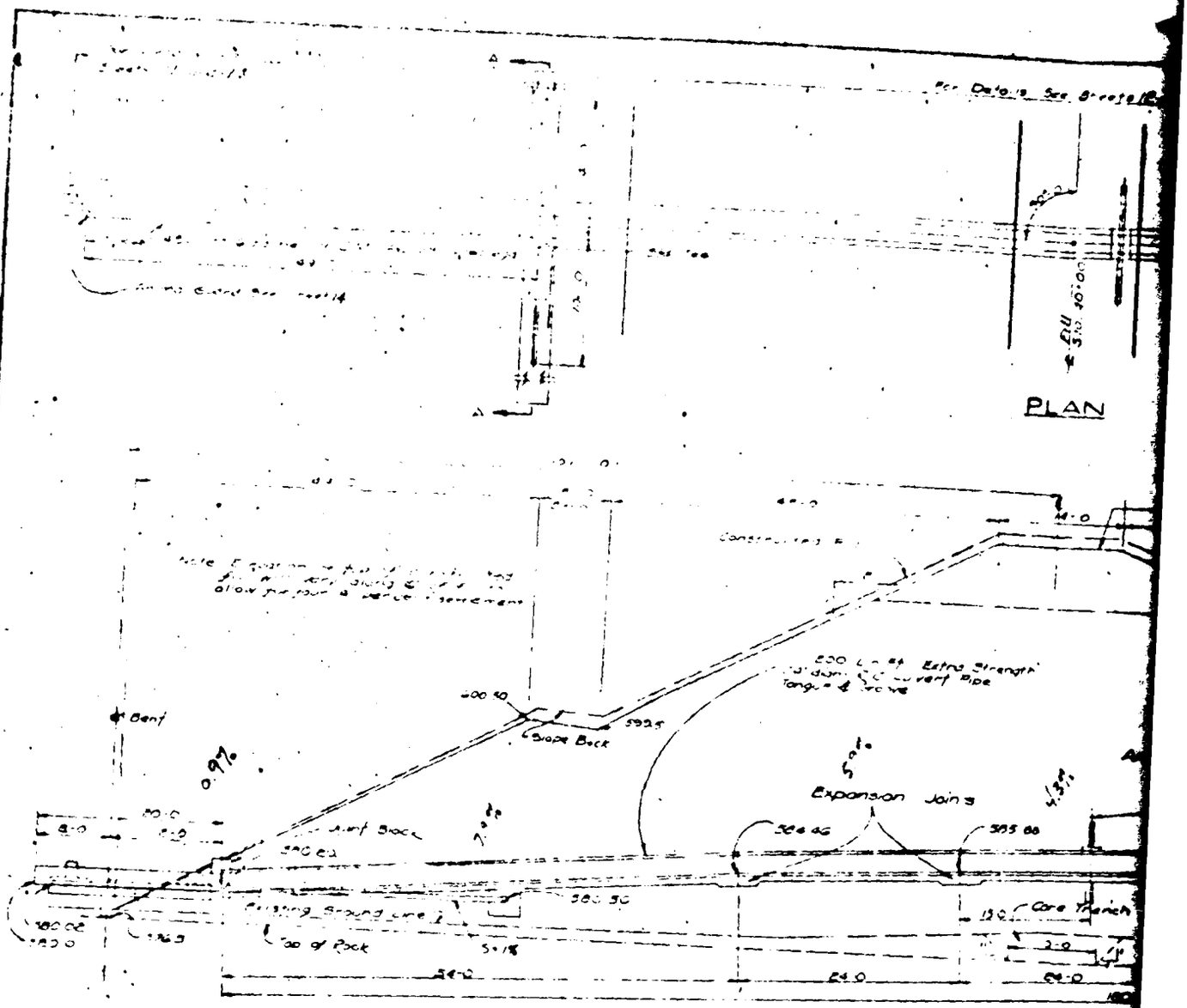
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Engineer
Engineer
Engineer

9-P-1495-P

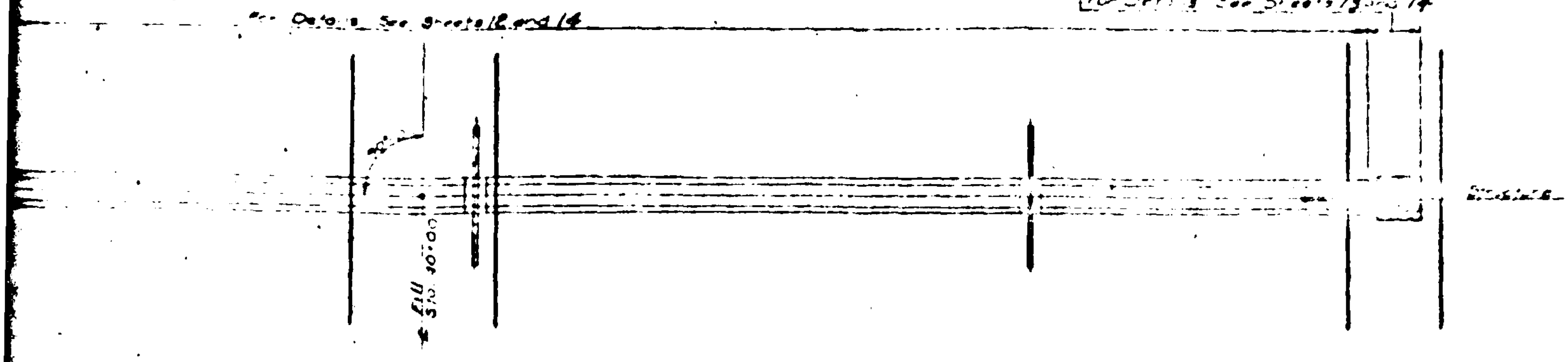

MAIN DRAIN
Approx. limits
Boring
Pits
Soil samples


Barn
Lane
BRANCH 2
BRANCH 1
Base Line
Work Units
Site Map of Subsurface Explorations Structure #2
Minor Watershed D Part I
Lost Creek Watershed Protection Project
Soil District of Lincoln Co. Mo.
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Griesse!
Griesse!
Griesse!
9/15/59
S.D. 1495 P

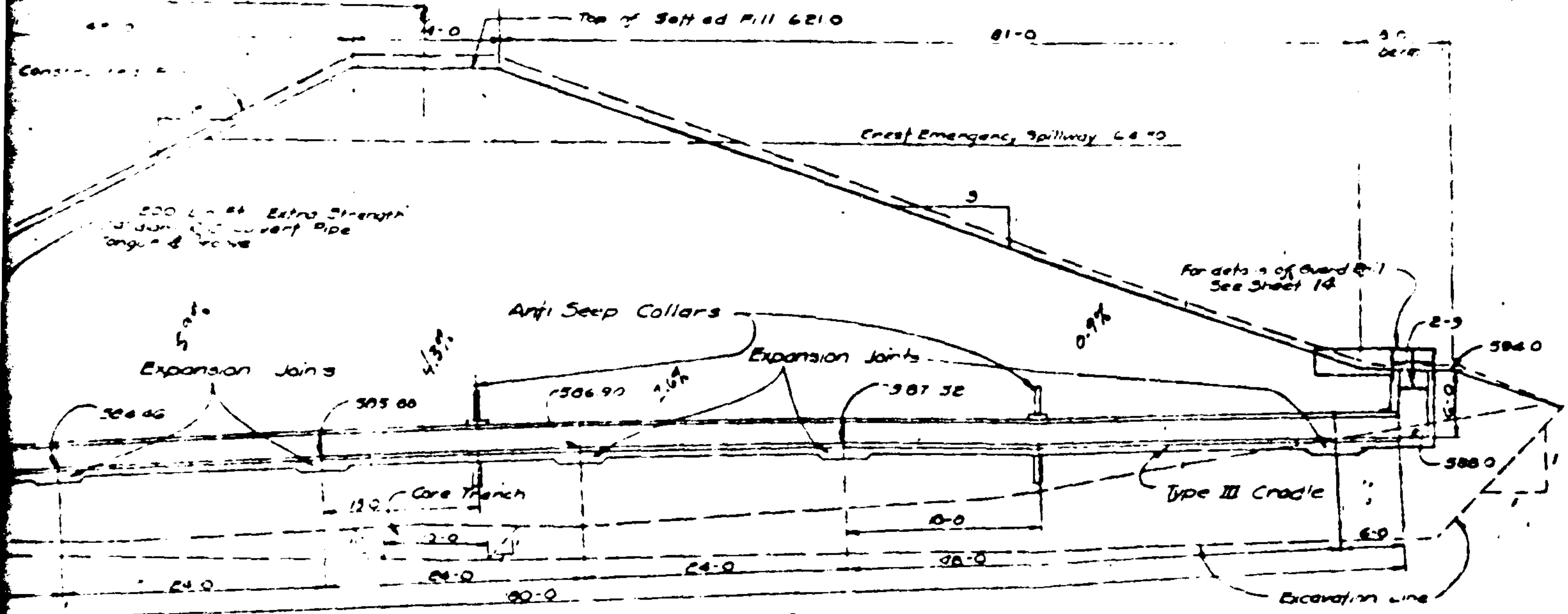


QUANTITIES

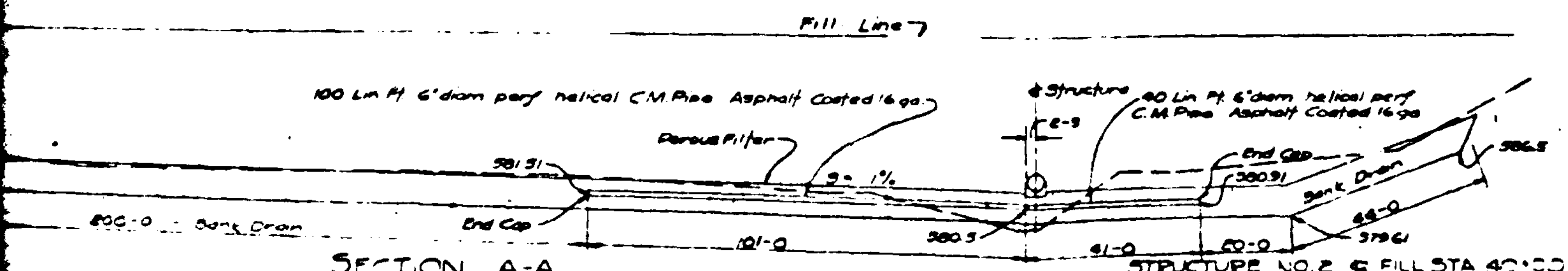
Reinforced Concrete
Steel Reinforcement
Bituminous Reinforced Concrete Culvert Pipe
Drainage Metal C.M.P. Perforated 6" diam.
6" diam. Bituminous
Bank Drains



PLAN



SECTION ON CENTERLINE



SECTION A-A

EMBANKMENT DRAINAGE SYSTEM
See Sheet 14 For Details of Cross Section

QUANTITIES

Reinforced C[illegible]	58.18 Cu Yds
Steel Reinfor[illegible]	2012 7 LBS
S[illegible]way-Reinforced Concrete [illegible]lvert Pipe 24" diam Extra Strength	200.0 Lin Ft
Drainage-[illegible] of C.M.P. Perforated 6"diam 6ga Asphalt Coated	140.0 Lin Ft
" " 6"diam 16ga Asphalt Coated	49.0 Lin Ft
Bank Drains	119.6 Cu Yds
Guard Rail	Part Job

STRUCTURE NO. 2 ℄ FILL STA 40+00

R/C DROP INLET 24" DIAM PIPE
GENERAL LAYOUT
Lost Creek Watershed Protection Project
Soil District of Lincoln Co. Mo.
Minor Watershed D, Part I

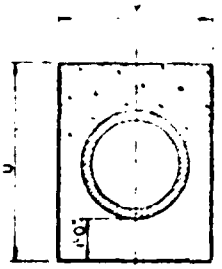
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

J. A. Shasek	2-20-56	
E. G. Ranch	2-21-56	
D. Nessowitz	2-23-56	
R.N. Lusbcke	3-28-56	Sheet 10 of 12 · 3-P-11495-RP

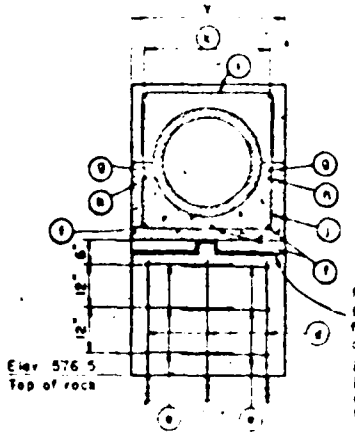
STEEL SCHEDULE

	12" DIAM PIPE	15" DIAM PIPE	18" DIAM PIPE	21" DIAM PIPE	24"
Footing					
Pier					
Cap					
Beam					
Bent					
Cradle					
Cradle					
Cradle					
Cradle					
Cradle					
Cradle					
CG2					

R/C PIPE DIAM	DIMENSIONS Z	Y	X	A	V	U	T	S	STEEL QUANTITIES Footing	Pier	Beam	Total	CONCR Footing	Bent
12"														
15"														
18"														
21"														
24"														



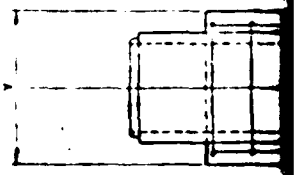
SECTION B-B

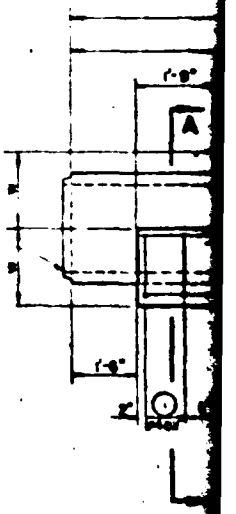


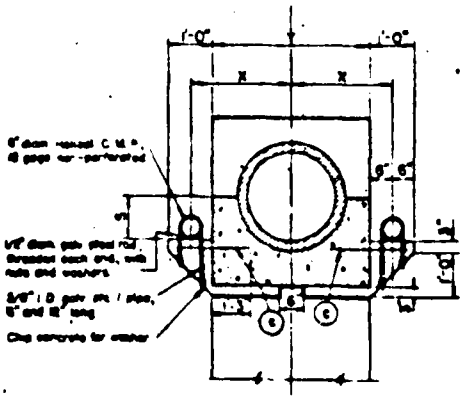
SECTION A-A

Notes
Pipe Cradle to be separated from pier by 4 premolded asphaltic expans. joint filler

Entire joint between pier and pipe cradle may be inserted at option of contractor, so that joint proper will be at bottom of cradle, and bottom of Keyway will be 3" below bottom of cradle

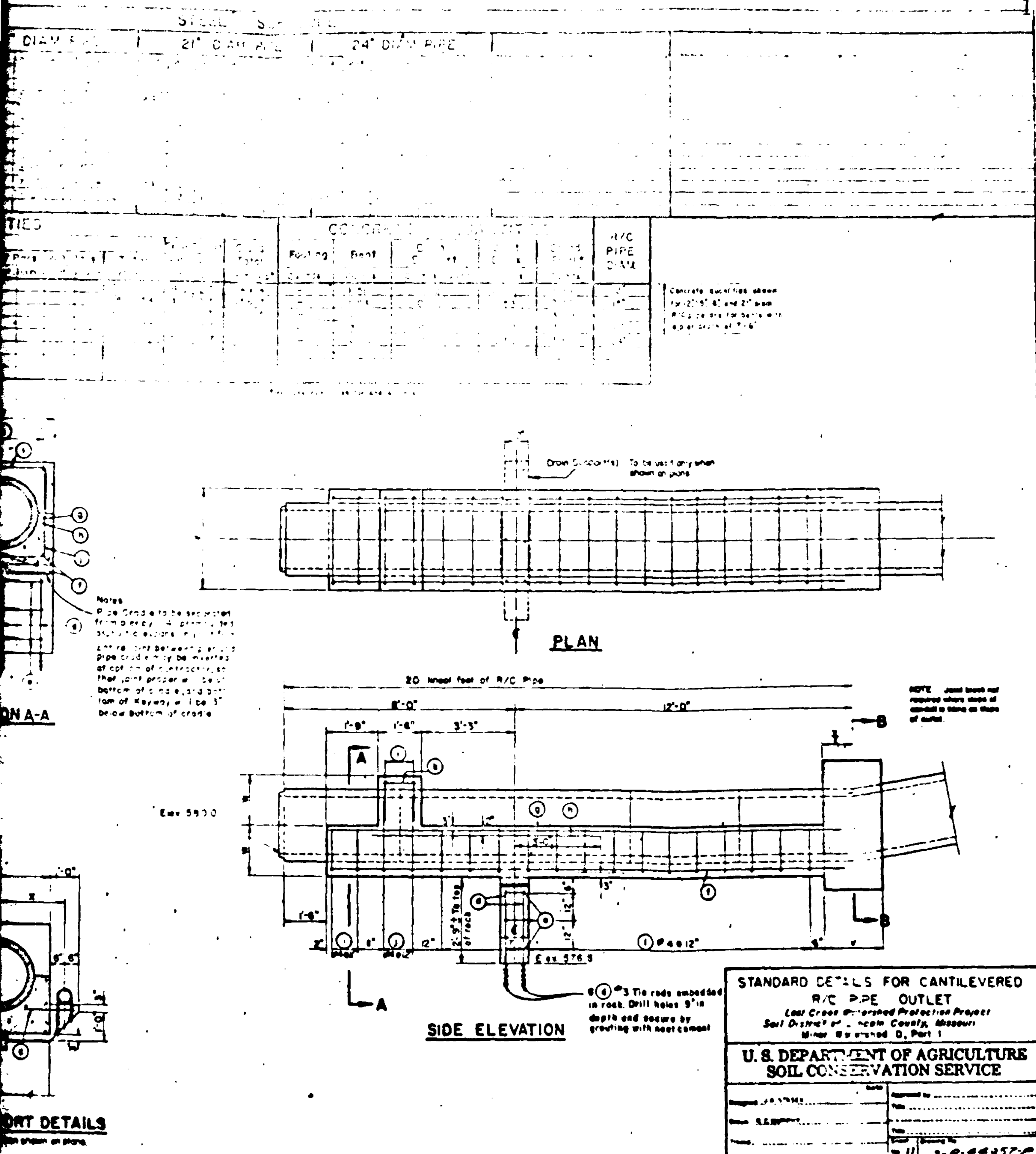






DRAIN SUPPORT DETAILS

To be used only when shown on plans

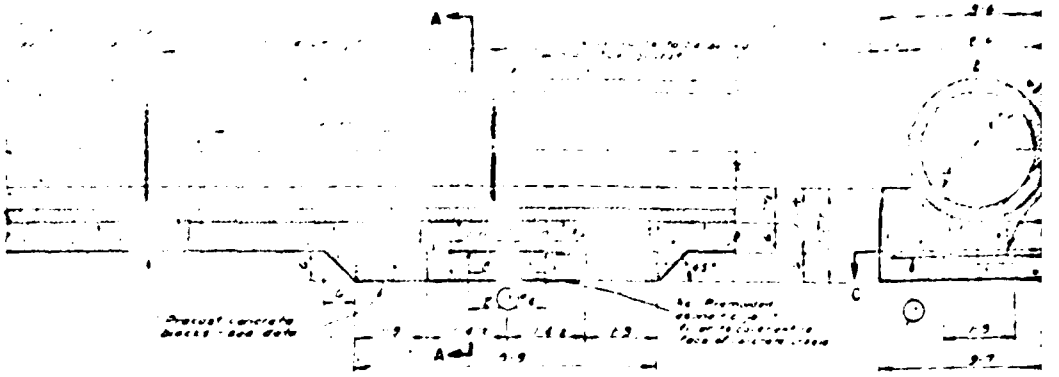


STANDARD DETAILS FOR CANTILEVERED
R/C PIPE OUTLET
Lost Creek Watershed Protection Project
Soil District of Lincoln County, Missouri
Minor Watershed D, Part 1

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

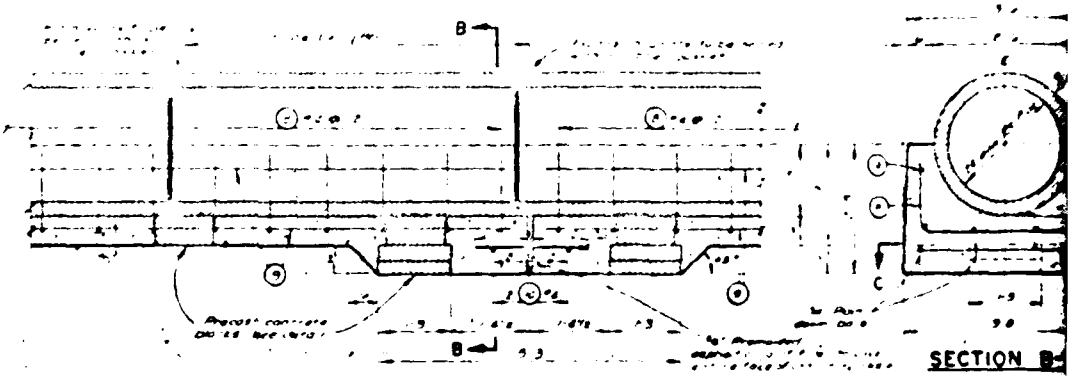
Drawing No. 3-P-44957-P
Sheet 11 of 14

1 3



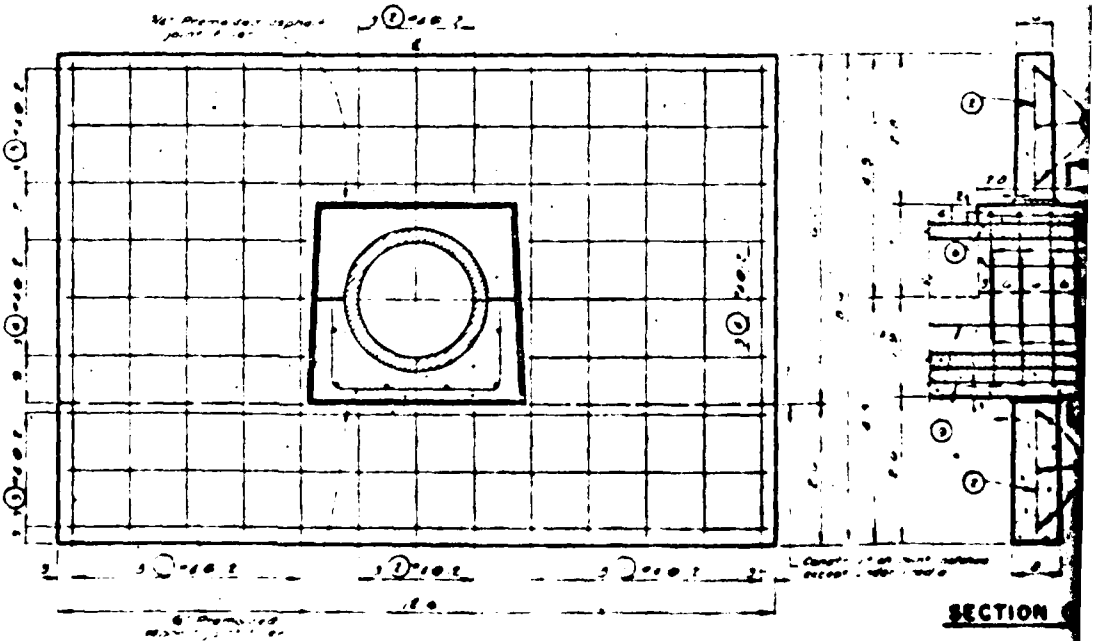
DETAILS OF EXPANSION JOINT AND TYPE II CRADLE

SECTION A-



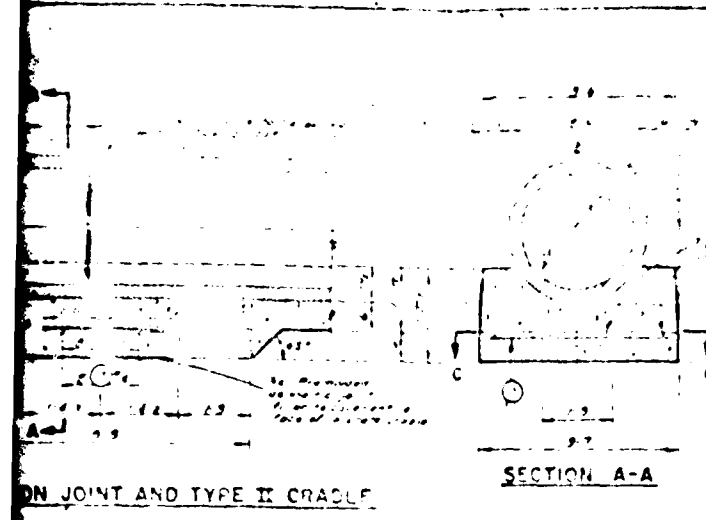
DETAILS OF EXPANSION JOINT AND TYPE III CRADLE

SECTION B-

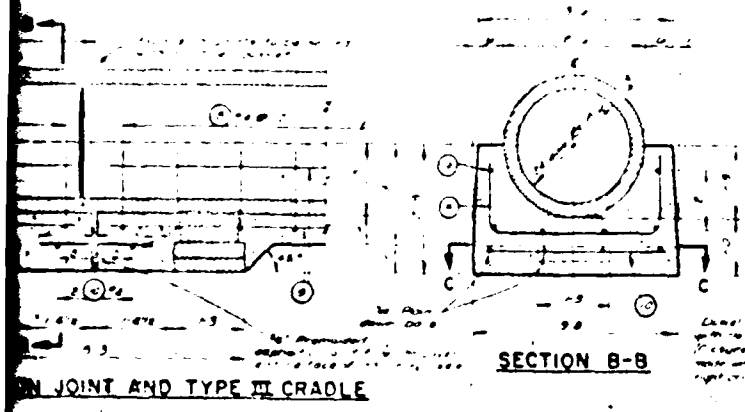


ELEVATION OF ANTI-SEEP COLLAR

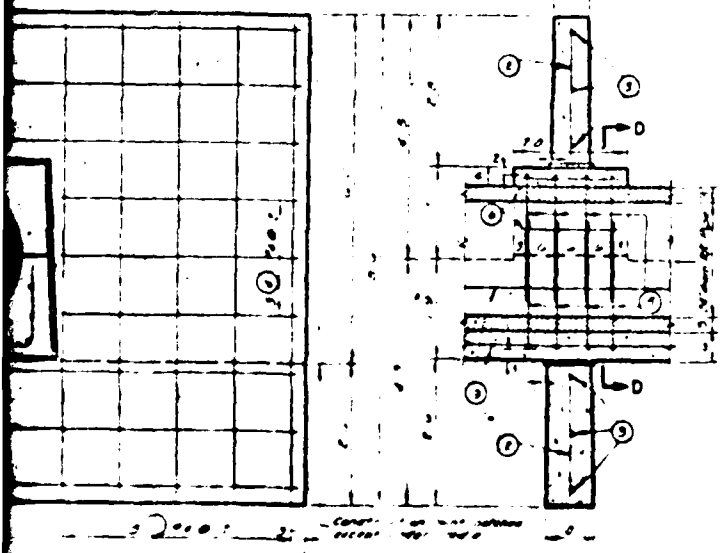
SECTION



ON JOINT AND TYPE II CRADLE



ON JOINT AND TYPE III CRADLE

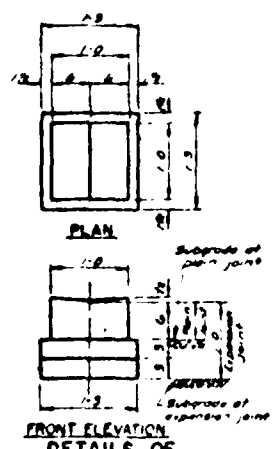


EP COLLAR

SECTION A-A

SECTION B-B

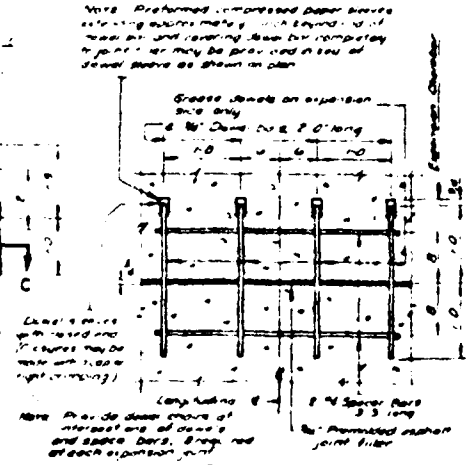
SECTION ON ℄



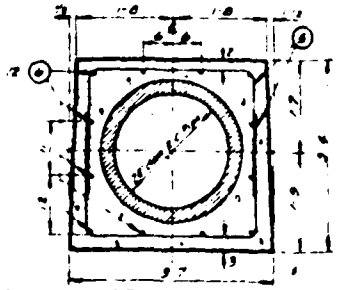
PLAN

FRONT ELEVATION

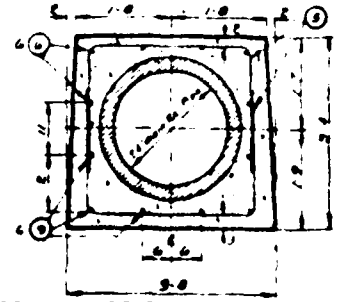
DETAILS OF PRECAST CONCRETE BLOCK



SECTION C-C



DETAILS OF TYPE II CRADLE



DETAILS OF TYPE III CRADLE

SECTION D-D

STEEL SCHEDULE

ANTI-SEEP COLLAR

TYPE II CRADLE

TYPE III CRADLE

QUANTITIES

ANTI-SEEP COLLAR WITH TYPE II CRADLE

ANTI-SEEP COLLAR WITH TYPE III CRADLE

TYPE II CRADLE (per linear ft)

TYPE III CRADLE (per linear ft)

EXPANSION JOINT (per Exp Joint)

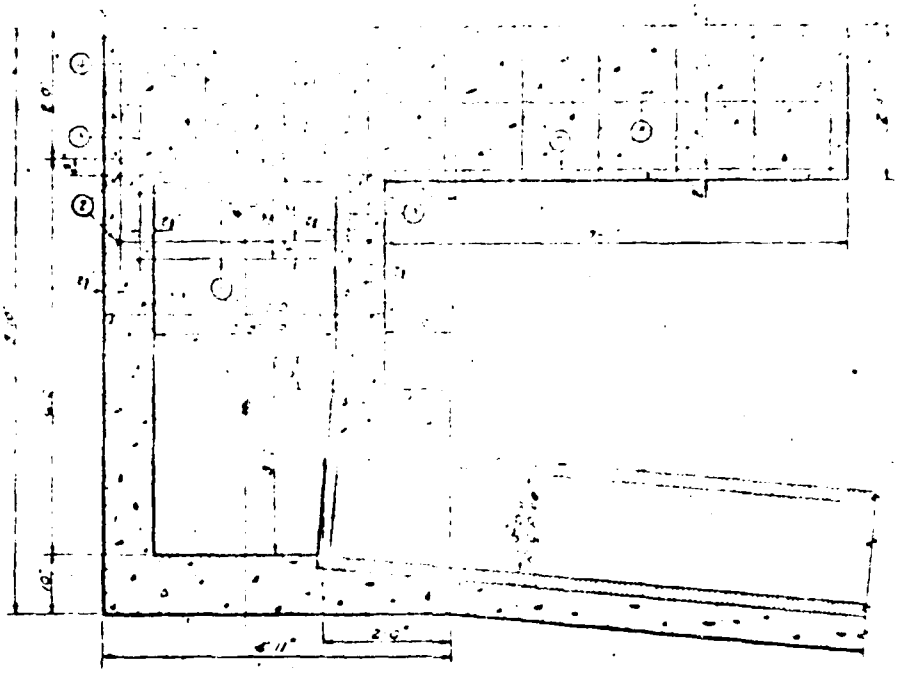
DOWEL BARS

REINFORCED CONCRETE DROP INLET 24" PIPE
DETAILS OF TYPE II, III CRADLE, ANTI-SEEP COLLAR

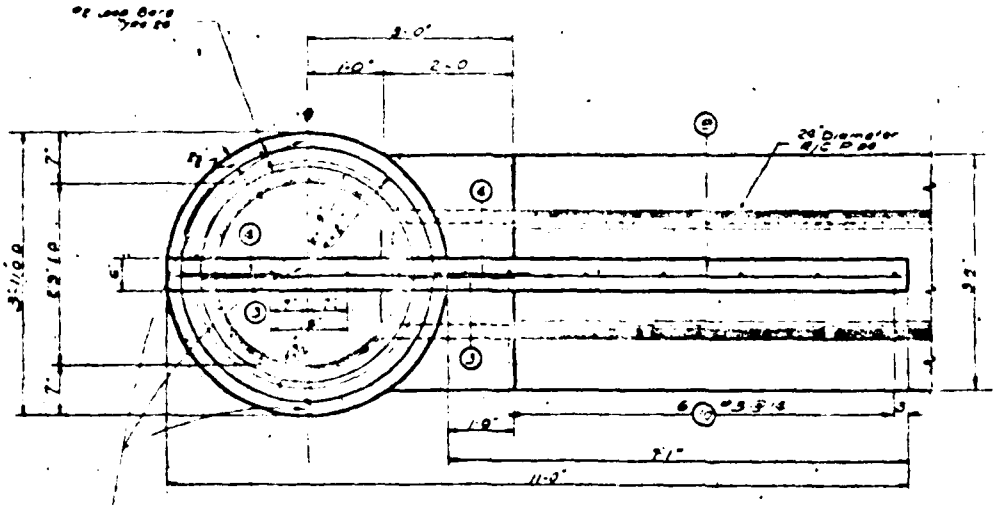
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

1

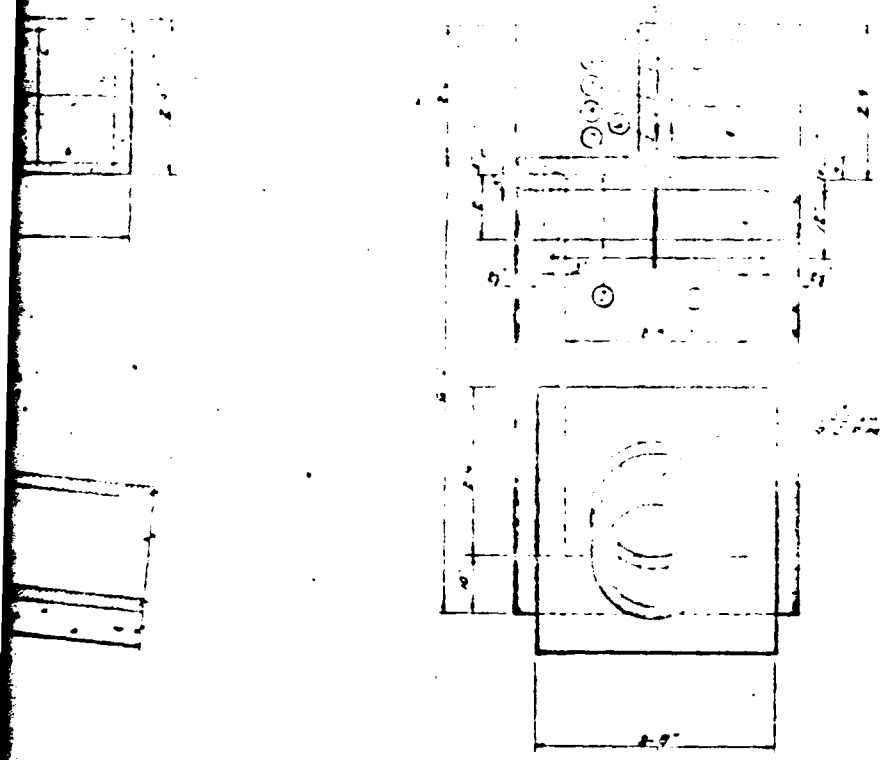
2



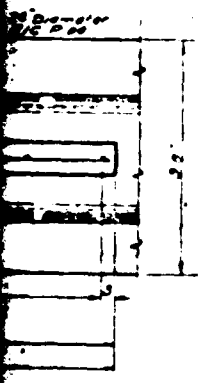
SECTION ON CENTERLINE



PLAN



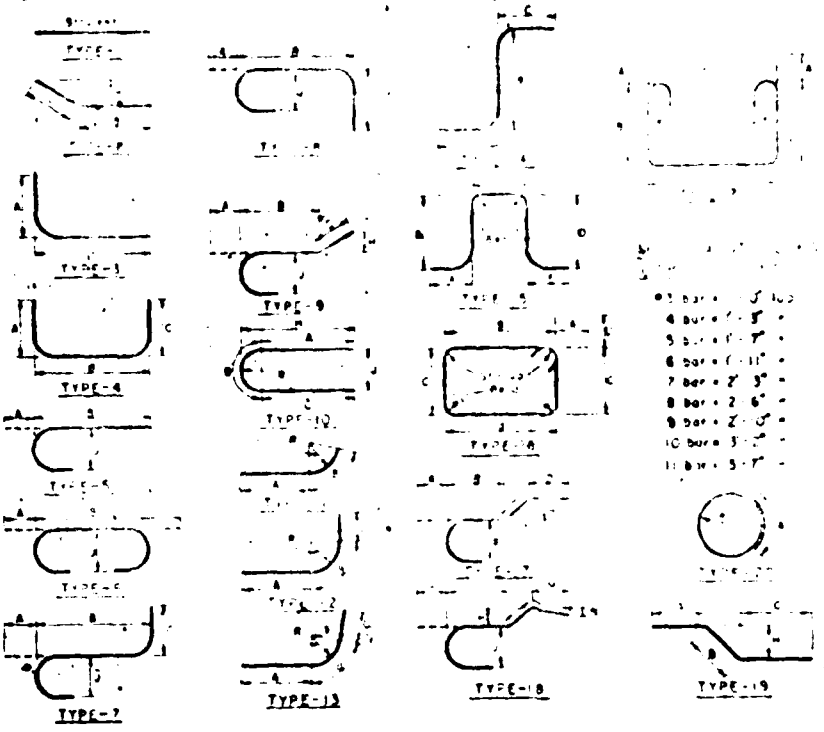
REAR ELEVATION



CONSTRUCTION NOTE
METAL FORMS ARE AVAILABLE AT THE ST CHARLES CO. SOIL DISTRICT OFFICE LOCATED AT ST CHARLES [illegible], AND CAN BE RENTED FOR A NOMINAL FEE

CONCRETE CIRCULAR RISER
FOR 24" DIA. R/C PIPE
East Creek watershed Protection Project
Soil District of Lincoln Co. Mo
Miner Watershed 'D' Post 1

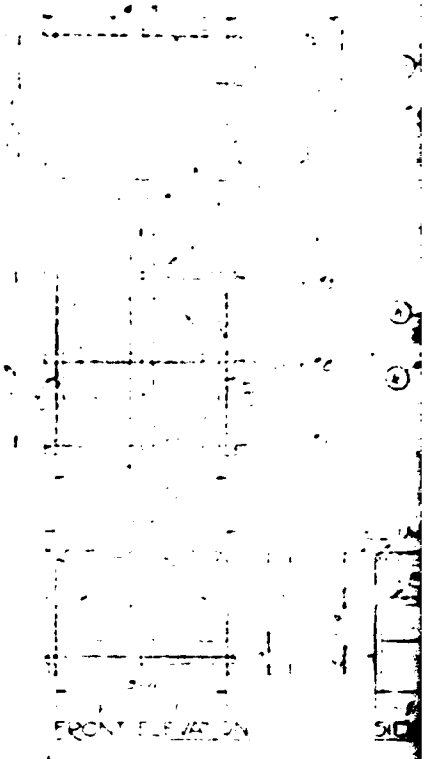
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



NOTE All bends not shown to scale. All shall conform to the provisions of A.C.I. Code as recommended by ...
All dimensions are measured from outside to outside of bar, except where shown to scale.
It shall be the responsibility of the fabricator to ... of shop drawings and ...

BAR TYPE DETAILS

Bar sizes 1-2 & 3-4



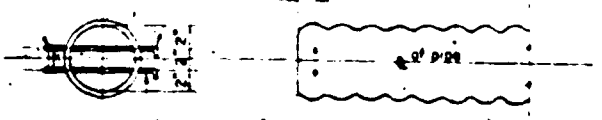
DETAIL OF GU...

BILL OF MATERIAL			
Pipe Diam.	Bar Size	Quantity	Length
6"	#3 or #4	2	1'-2"
8"	#3 or #4	3	1'-3"
10"	#3 or #4	4	1'-6"

All holes in pipe to receive bars shall be 9/16" dia.

Drill 1/8" hole, 1" from end of bars to receive nail or wire

1½" or 2" bend



Bars spaced 2" on centers

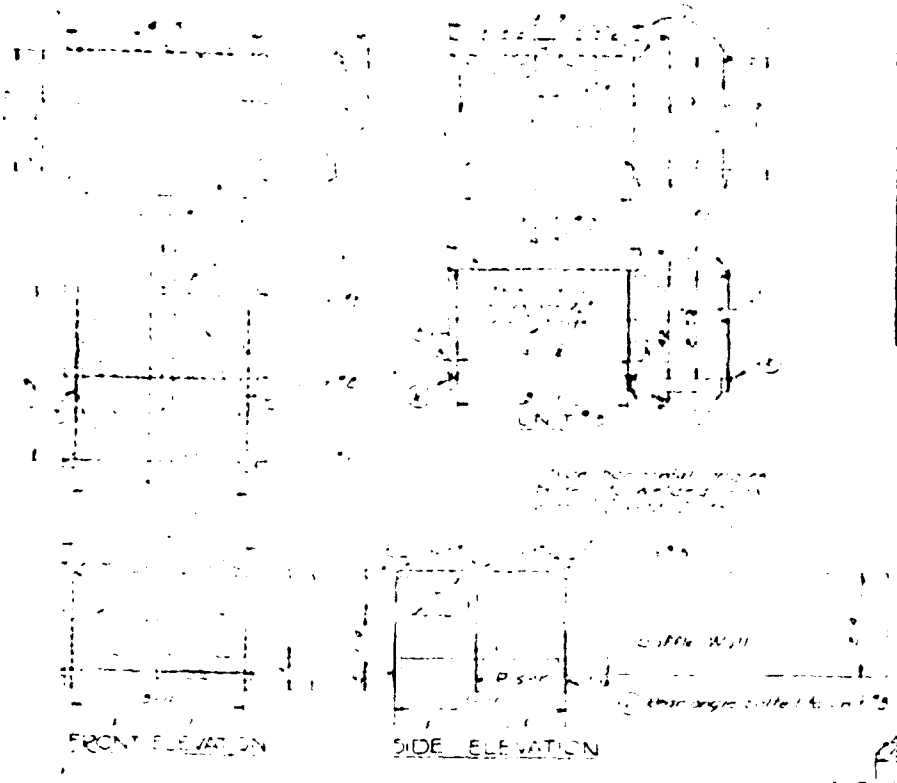
DETAILS OF ANIMAL GUARD

Perous filter con...
perforated pipe ...
Pit-Run sand and...

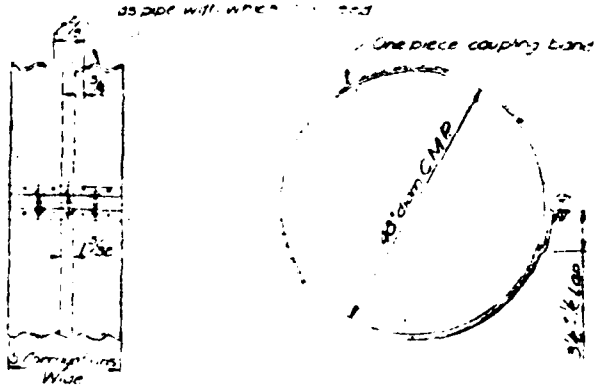
6" diam. Perforated Helical C.M. Pipe Drain

CROSS S...

6" PER...

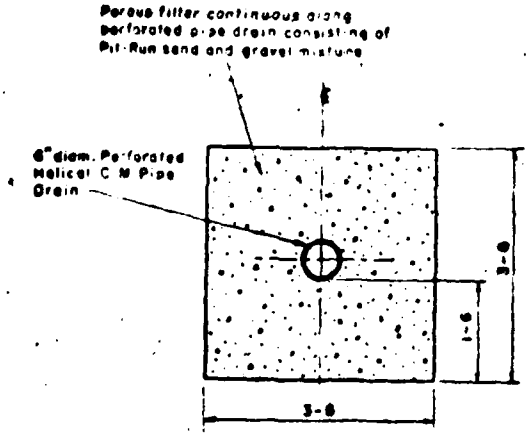


DETAIL OF GUARD RAIL



DETAILS OF COUPLING BAND

Not to Scale



CROSS SECTION OF POROUS FILTER FOR

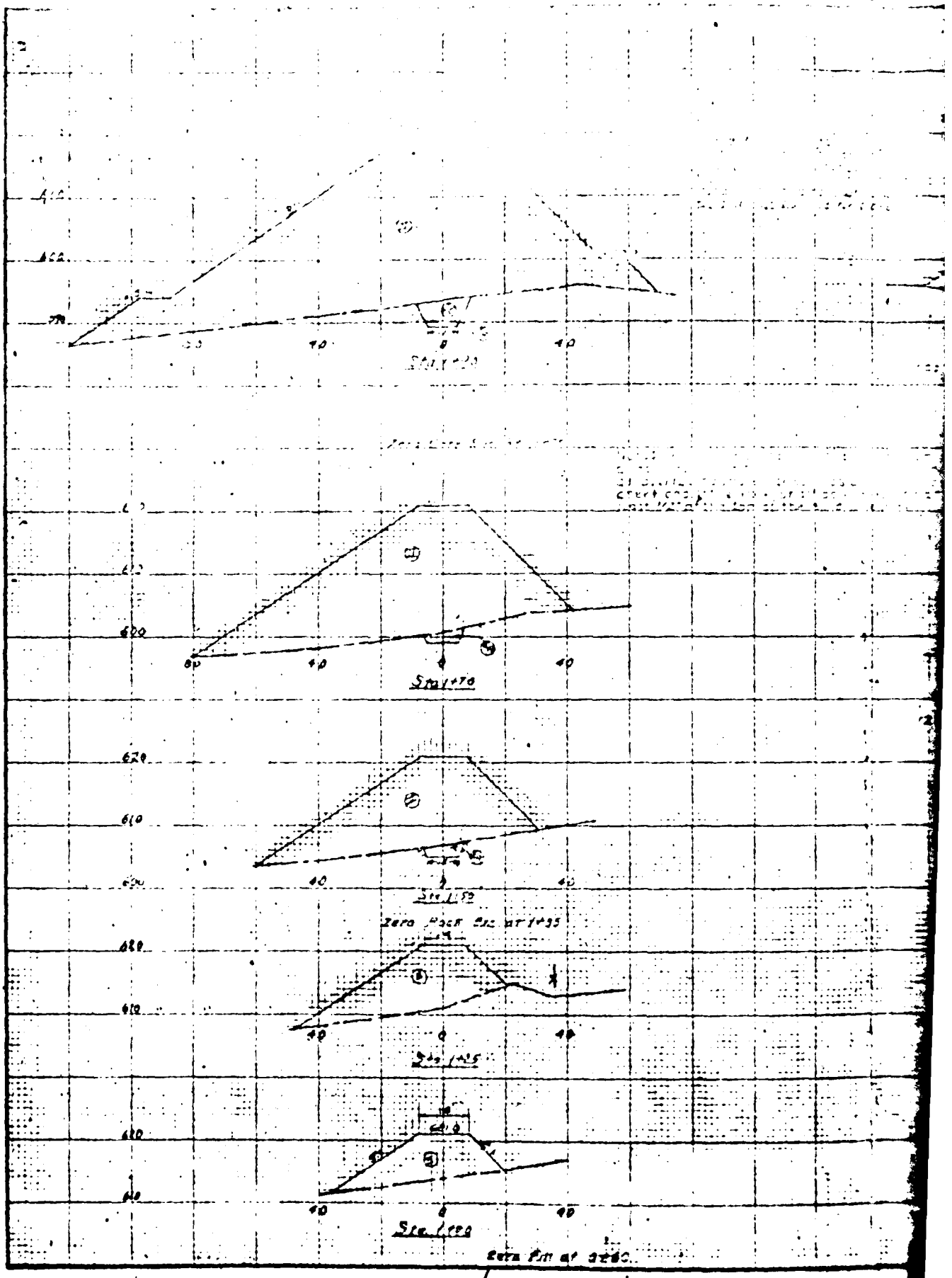
6" PERFORATED HELICAL C.M. PIPE

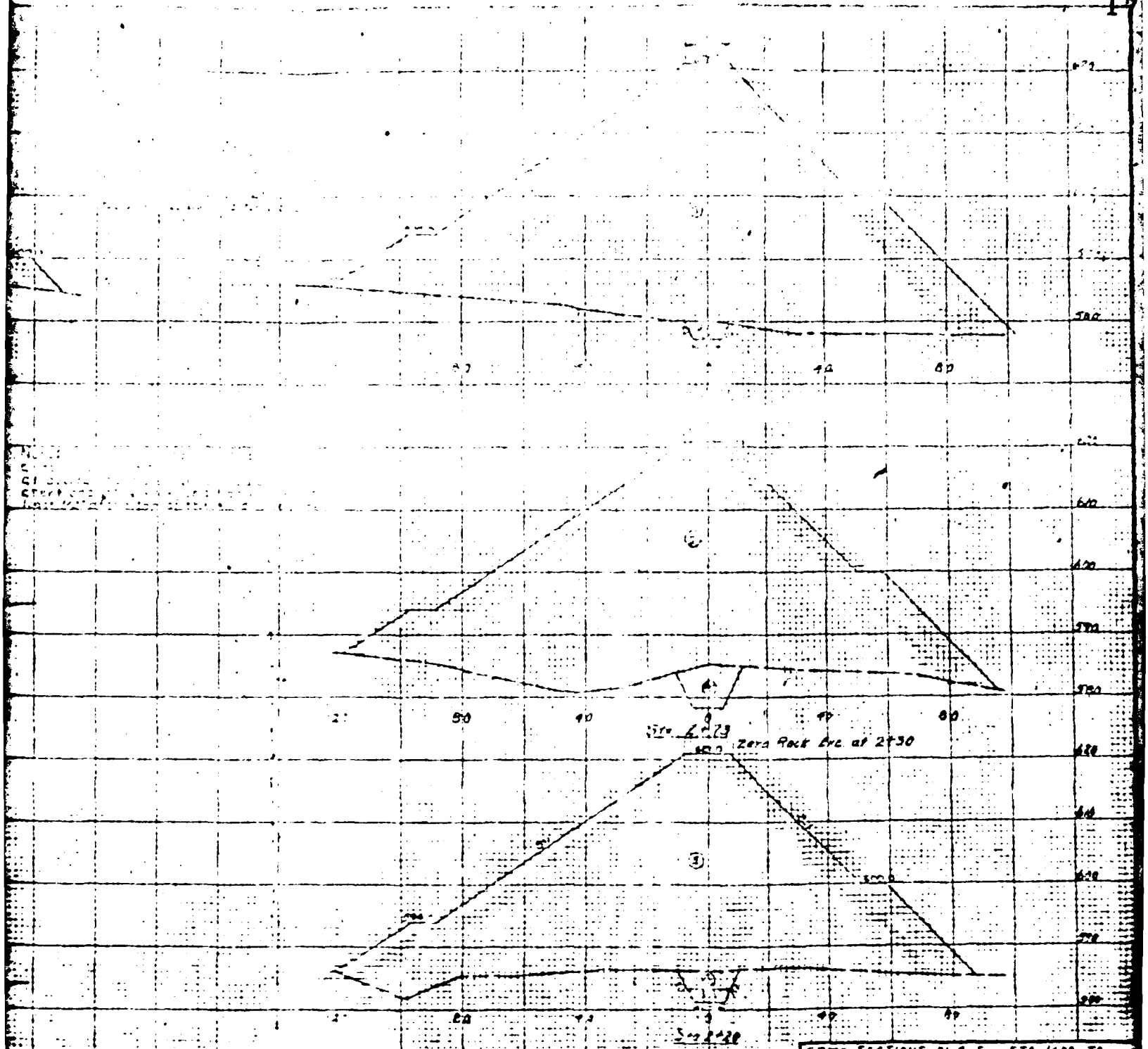
STANDARD DETAILS

Lost Creek Watershed Protection Project
Soil District of Lincoln County, Missouri
Watershed D Part I

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by	
Drawn D Nasgowitz	5-1-56	Title State Conservation Engr.	
Traced		For Administrator, Soil Conservation Service	
Checked FQ Lee	8-1-56	Sheet No. 14 of 14 sheets	Drawing No. 3-P-44957-P

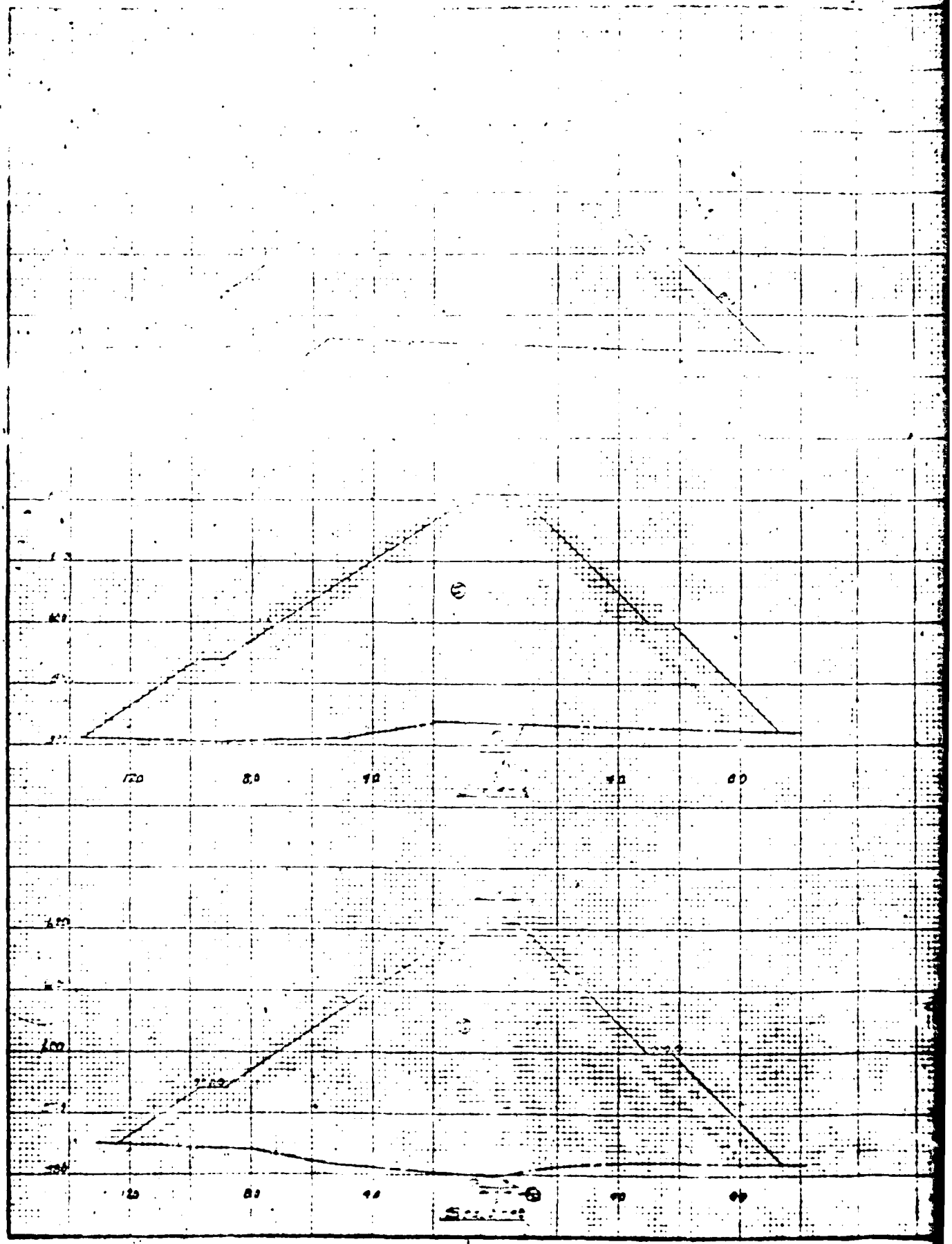

Sta 1+20
Sta 1+70
Sta 1+95
Zero Back Slope at 1+95
Sta 1+15
Sta 1+20
Zero Fill at 1+20

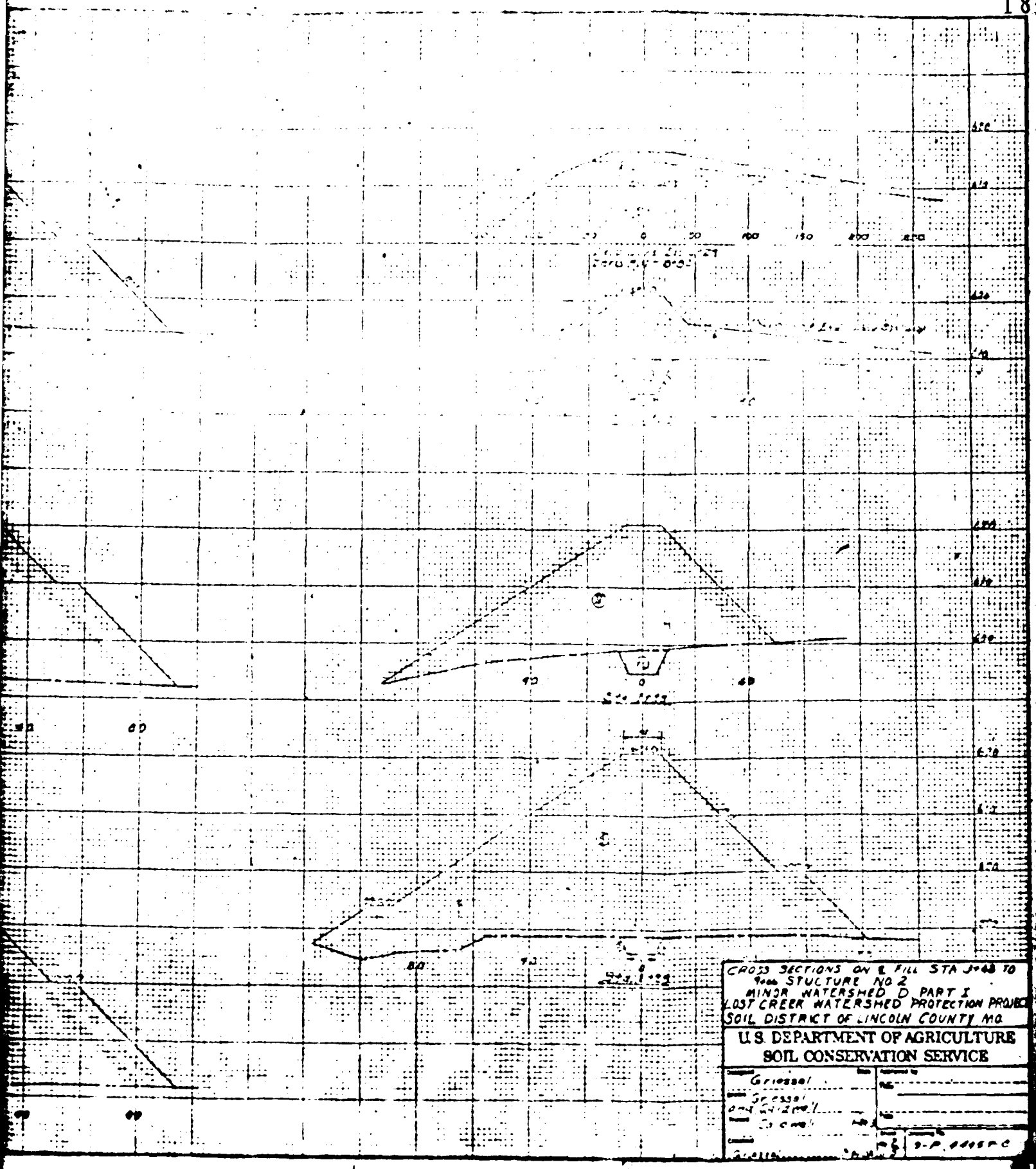


CROSS SECTIONS ON L FIL STA 1+00 TO 9+09 STRUCTURE NO 2
MINOR WATERSHED D, PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL DISTRICT OF LINCOLN COUNTY, MT.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed Griessel
Drawn Griessel and Caldwell
Traced Caldwell
Checked Griessel 3-19-58
Approved by
Date
Date
Sheet No. 1 of 1 Sheets
Drawing No. S.D.-4195-C





CROSS SECTIONS ON E FILL STA 3+48 TO
New STUCTURE NO 2
MINOR WATERSHED D PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL DISTRICT OF LINCOLN COUNTY MO.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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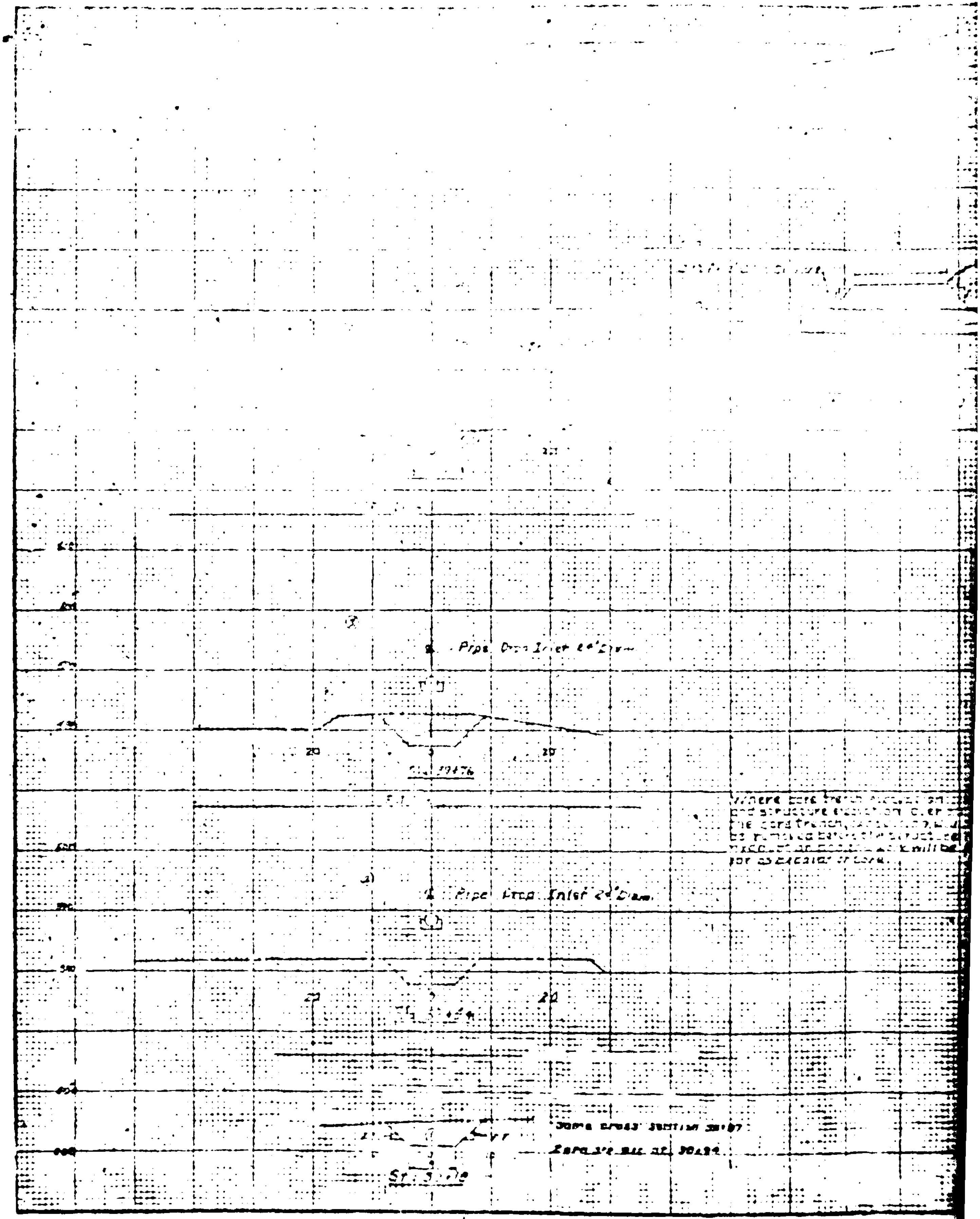
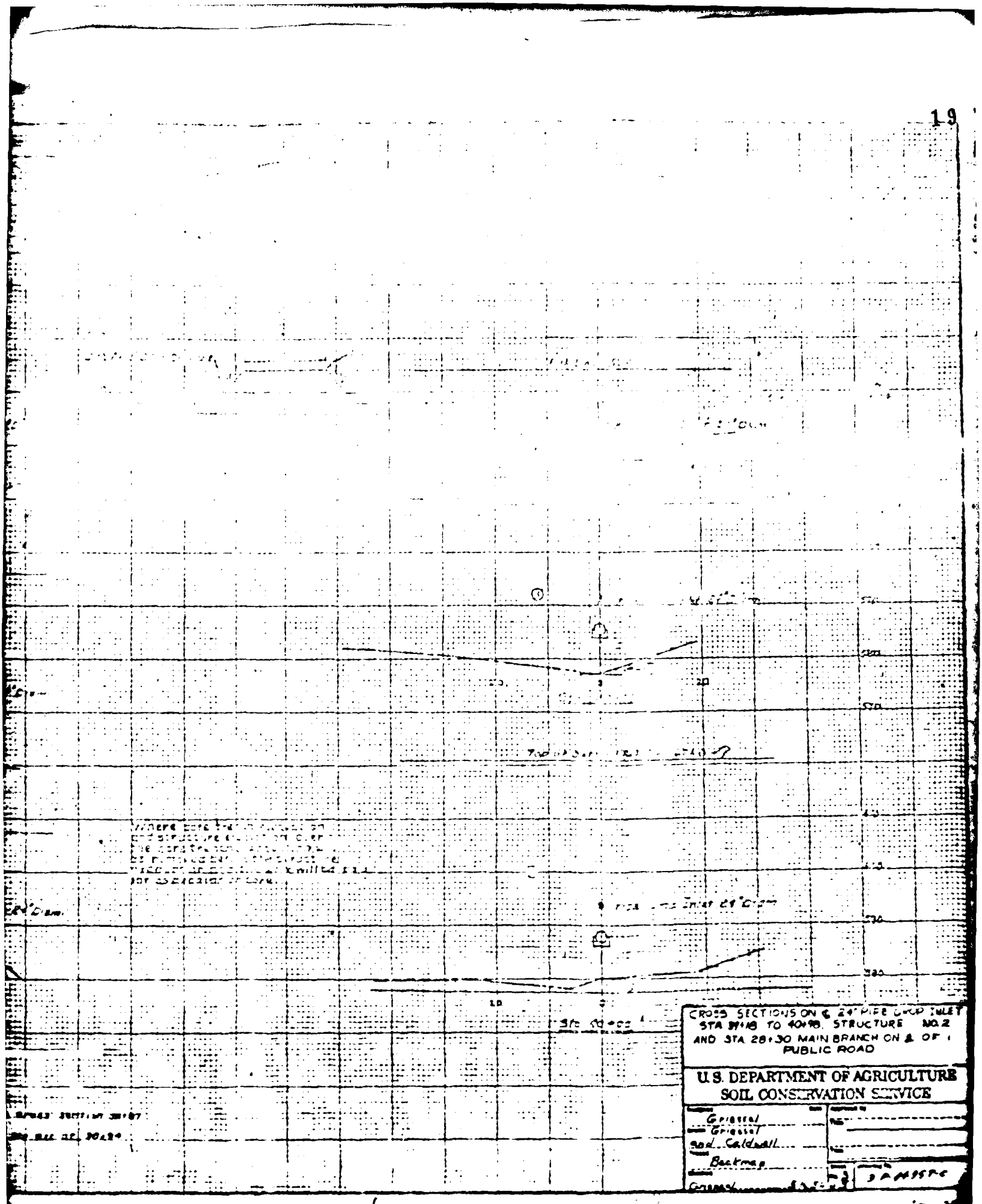
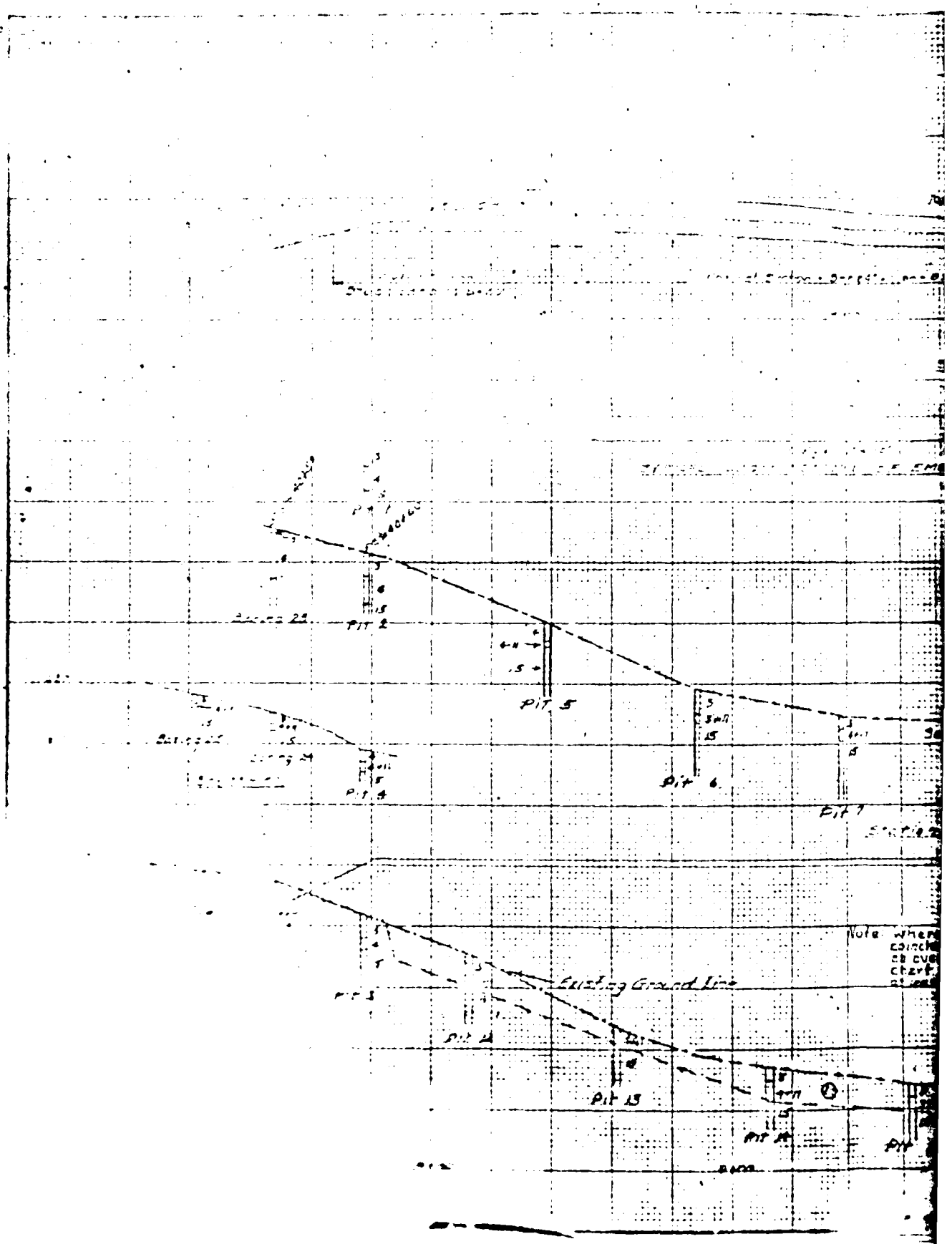

20
20
Pipe Drop Inlet 24" Diam.
20
20

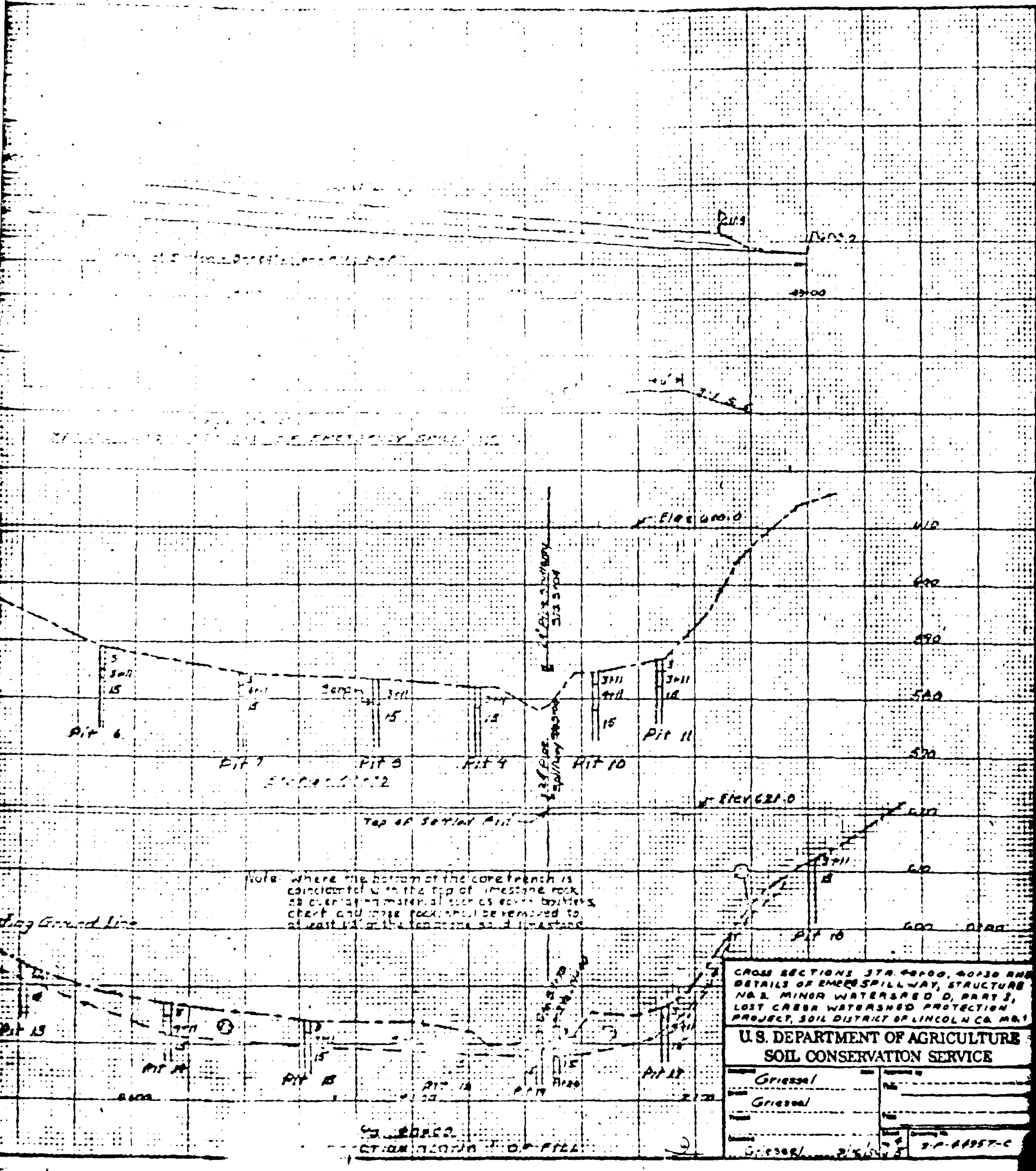


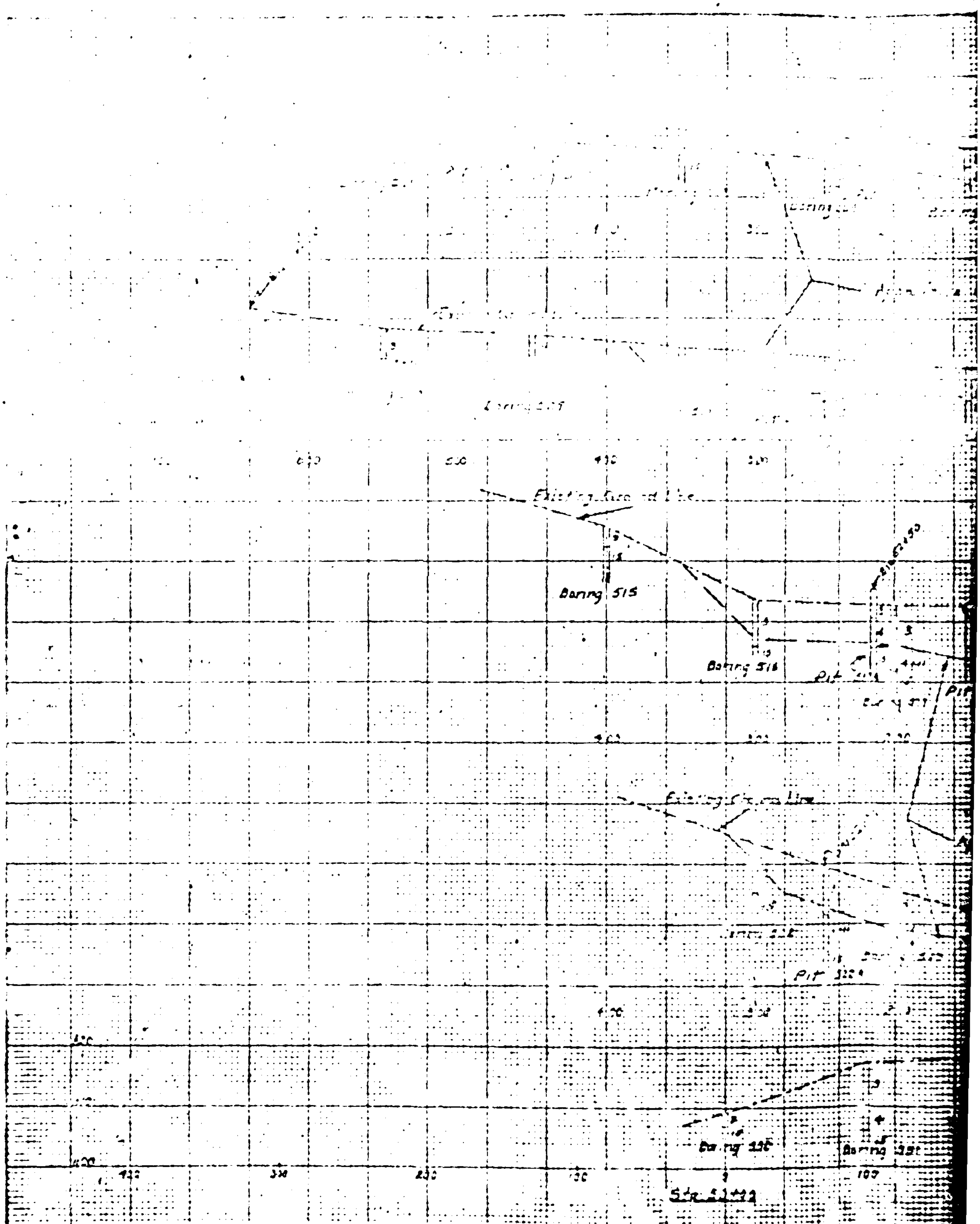
CROSS SECTIONS ON ℄ 24" PIPE CMP INLET STA 39+18 TO 40+98. STRUCTURE NO. 2 AND STA 28+30 MAIN BRANCH ON ℄ OF PUBLIC ROAD

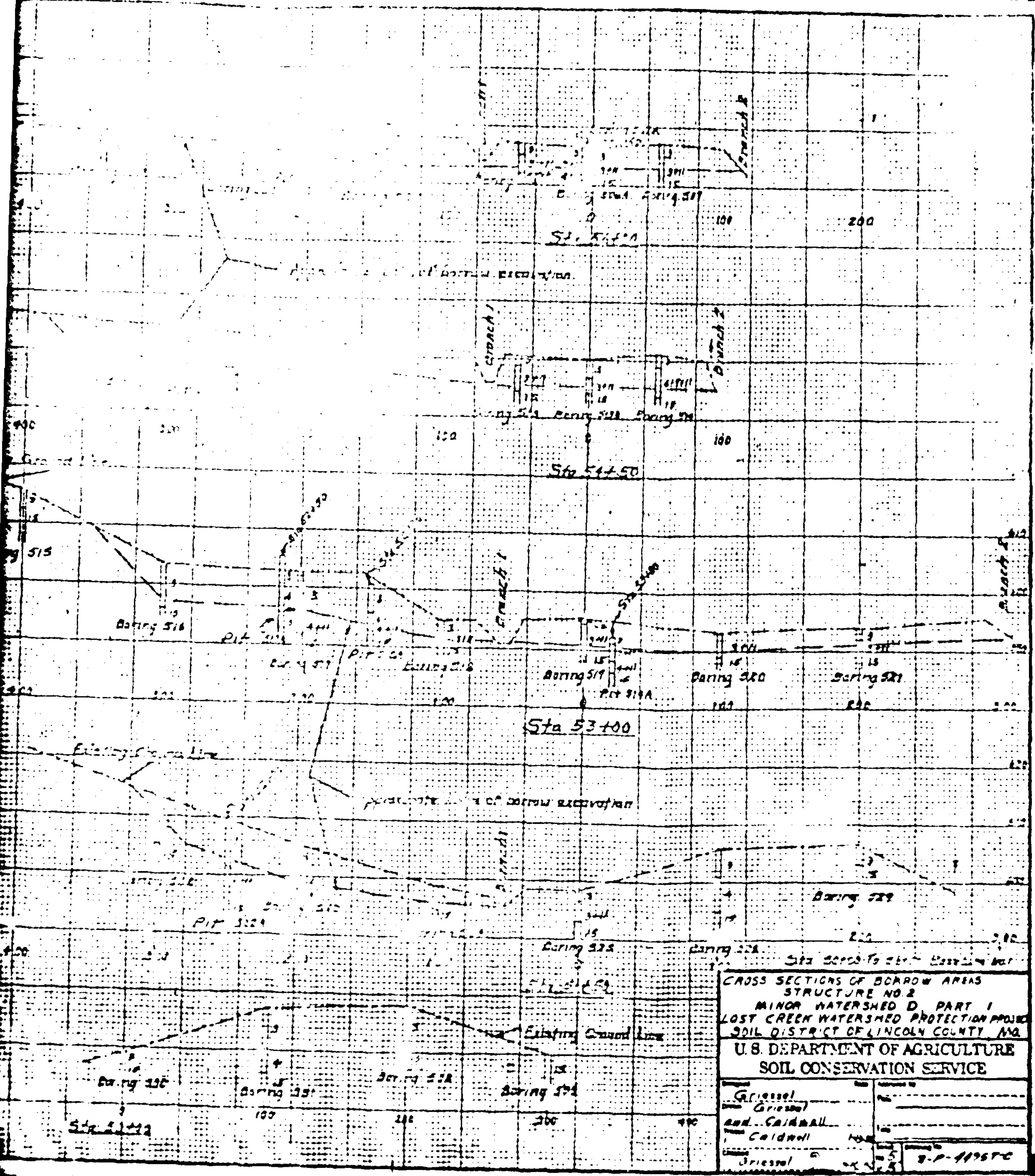
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

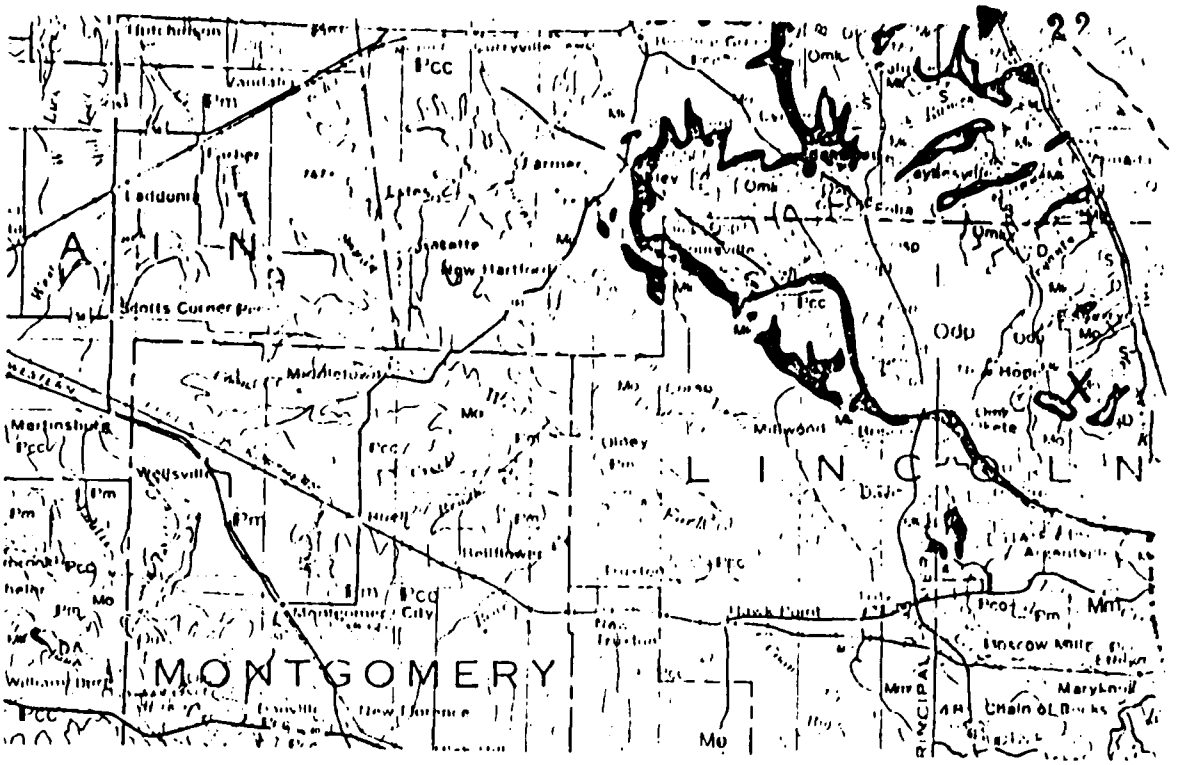
Griswold
Grissett
and Caldwell
Bastrop
County


Pit 2
Pit 5
Pit 6
Pit 7
Pit 4
Pit 3
Pit 13
Existing Ground Line


Pit 6
Pit 7
Pit 3
Pit 4
Pit 10
Pit 11
Elev 621.0
Top of Settled Fill
Note: where the bottom of the core trench is
coincidental with the top of limestone rock
all overlaying material such as earth boulders,
chert and loose rock should be removed to
Pit 13
Pit 14
Pit 15
Pit 17
Pit 20
Pit 18
CROSS SECTIONS STA. 40+00, 40+30 AND
DETAILS OF EMERG SPILLWAY, STRUCTURE
NO. 2 MINOR WATERSHED D, PART 3,
LOST CREEK WATERSHED PROTECTION
PROJECT, SOIL DISTRICT OF LINCOLN CO. MO. 1
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Griessel
Griessel
Griessel
7-P-44957-C


Existing Ground Line
Boring 515
Boring 516
Existing Ground Line
100


Trench 2
Boring 518
Boring 517
100
200
Sta 55+00
Branch 1
Branch 2
Boring 513
Boring 512
Boring 514
100
Sta 54+50
Boring 515
Branch 1
Branch 2
Boring 516
Boring 519
Pit 519A
Boring 520
Boring 521
Sta 53+00
Existing Ground Line
Approximate limits of borrow excavation
Boring 529
Pit 524
Boring 525
Existing Ground Line
Boring 530
Boring 531
Boring 532
Boring 533
100
200
300
400
CROSS SECTIONS OF BORROW AREAS
STRUCTURE NO. 2
MINOR WATERSHED D PART I
LOST CREEK WATERSHED PROTECTION PROJECT
SOIL DISTRICT OF LINCOLN COUNTY MO.
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Griessel
Griessel
Caldwell
Caldwell
Griessel
5
5
7-P-11956-C



QUARTERNARY — Qal - ALLUVIAN

PENNSYLVANIAN — Pcc - CHEROKEE GROUP

MISSISSIPPIAN
- Mm - MERAMECIAN SERIES
- Mo - OSAGEAN SERIES
- Mk - KINDERHOOKIAN SERIES, CHOTEAU GROUP

DEVONIAN — DEVONIAN UNDIVIDED

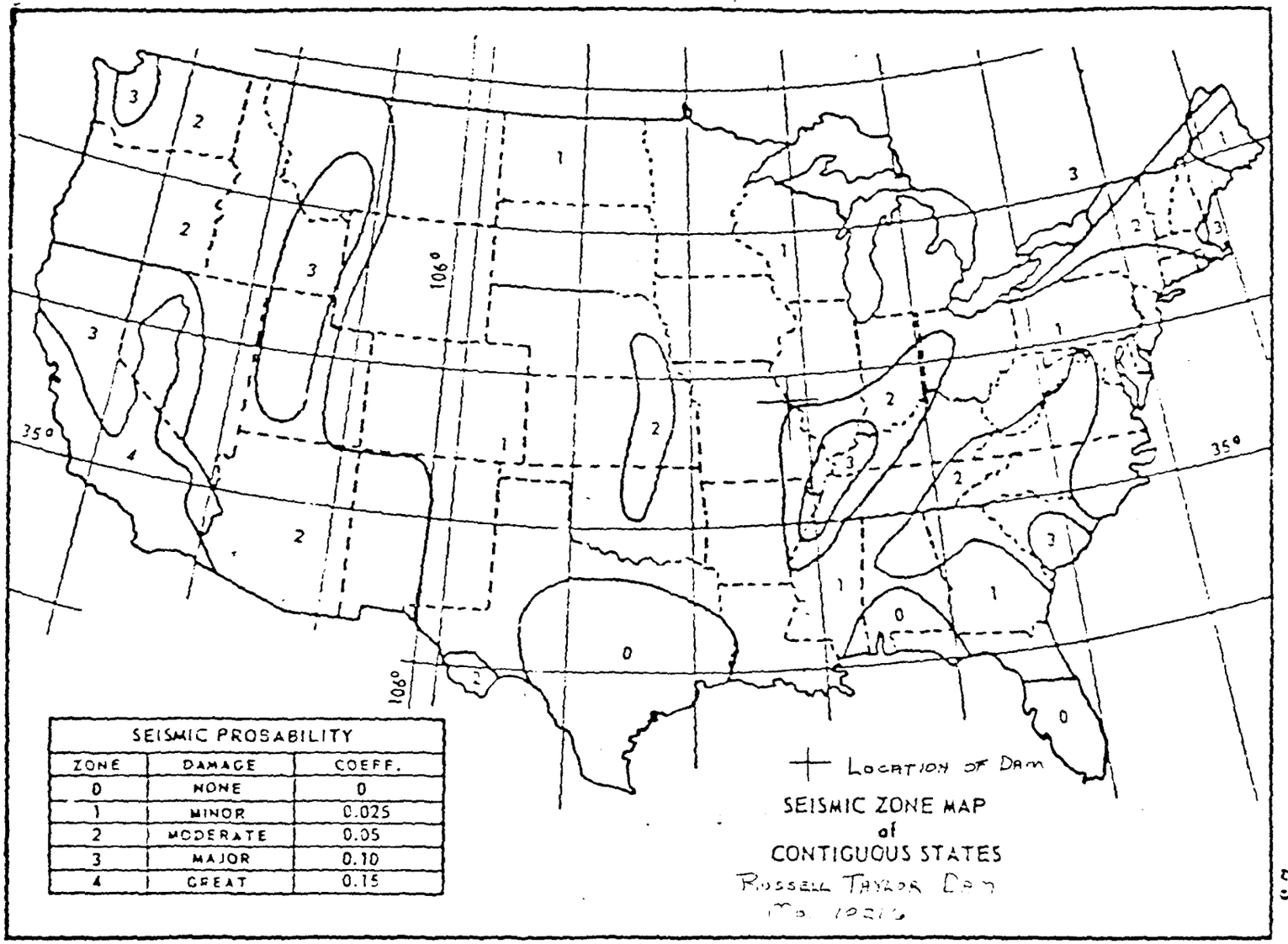
SILURIAN — S - SILURIAN UNDIVIDED

ORDOVICIAN
- Omk
  - NOIX LIMESTONE
  - MAQUOKETA SHALE
  - CAPE LIMESTONE
  - KIMMSWICK FORMATION
- Odp
  - DECORAH FORMATION
  - PLATTIN FORMATION
- Osp - ST. PETER'S SANDSTONE

X - LOCATION OF DAM, MO. 10216

REFERENCE:
GEOLOGIC MAP OF MISSOURI, MISSOURI GEOLOGIC SURVEY, a) 1961, b) 1979

GEOLOGIC MAP OF LINCOLN COUNTY AND ADJACENT AREA



SEISMIC PROSABILITY		
ZONE	DAMAGE	COEFF.
0	NONE	0
1	MINOR	0.025
2	MODERATE	0.05
3	MAJOR	0.10
4	GREAT	0.15

SEISMIC ZONE MAP
of
CONTIGUOUS STATES
Russell Thayer Dam
Mo 10216

APPENDIX A

PHOTOGRAPHS TAKEN DURING INSPECTION

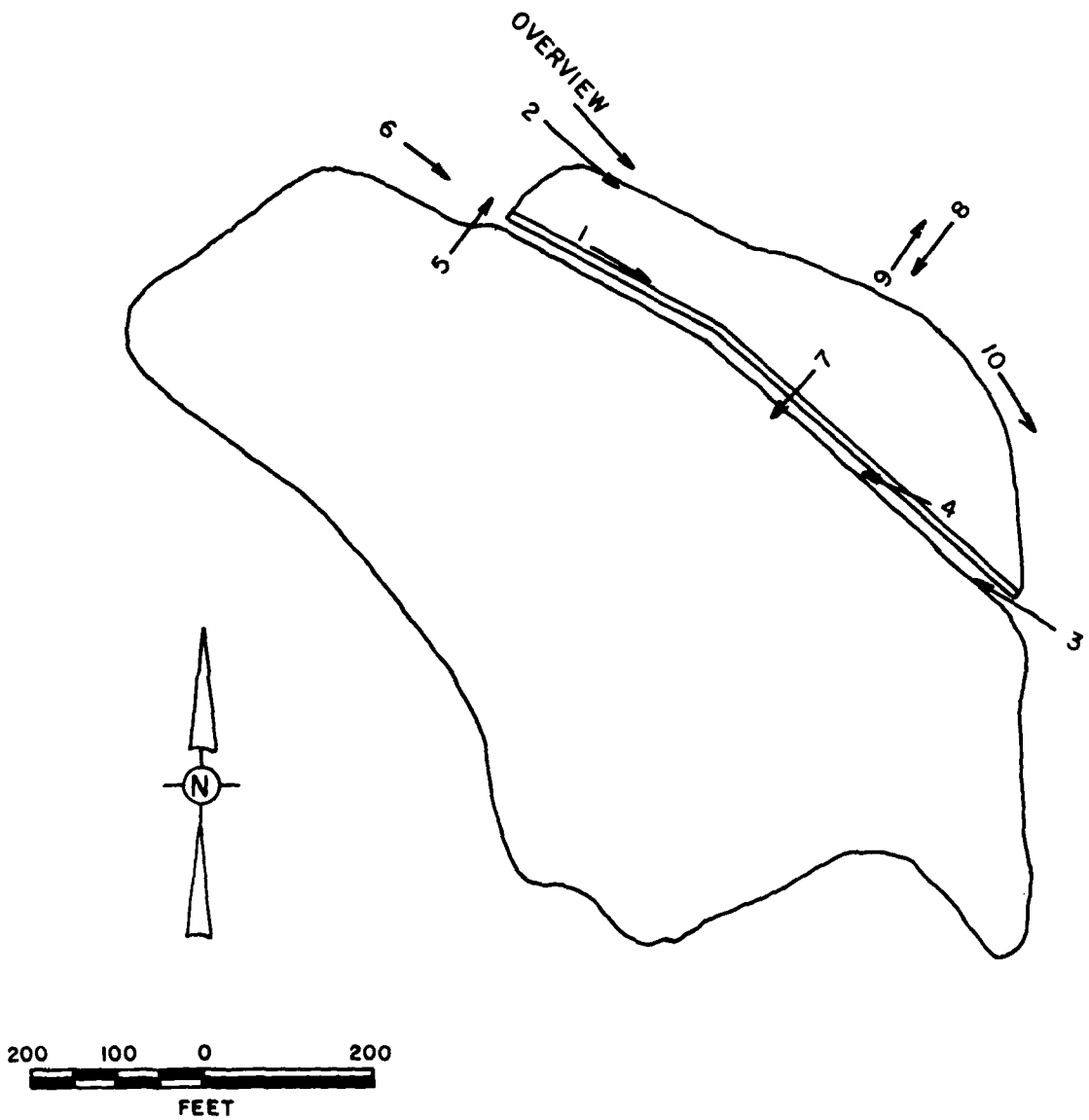


PHOTO INDEX
FOR
RUSSELL TAYLOR DAM

Russell Taylor Dam

Photo 1.	-	View of the crest of the embankment.
Photo 2.	-	View of the downstream embankment slope.
Photo 3.	-	View of the upstream embankment slope.
Photo 4.	-	View of the sloughing on the upstream embankment slope.
Photo 5.	-	View of the emergency spillway on the left abutment.
Photo 6.	-	View of the crest of the emergency spillway.
Photo 7.	-	View of the intake to drop inlet structure.
Photo 8.	-	View of the outlet of the 24-inch diameter concrete conduit. Note interceptor drain outlet and clay pipe housing, both are to the right of the conduit.
Photo 9.	-	View of the discharge channel of the 24-inch diameter concrete conduit.
Photo 10.	-	View of the seepage at the downstream toe near the right abutment.

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

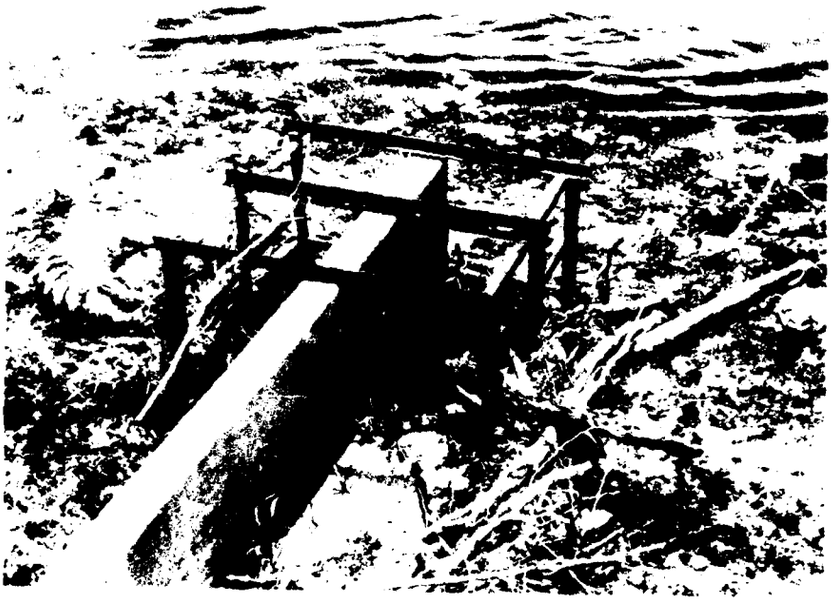


Photo 7

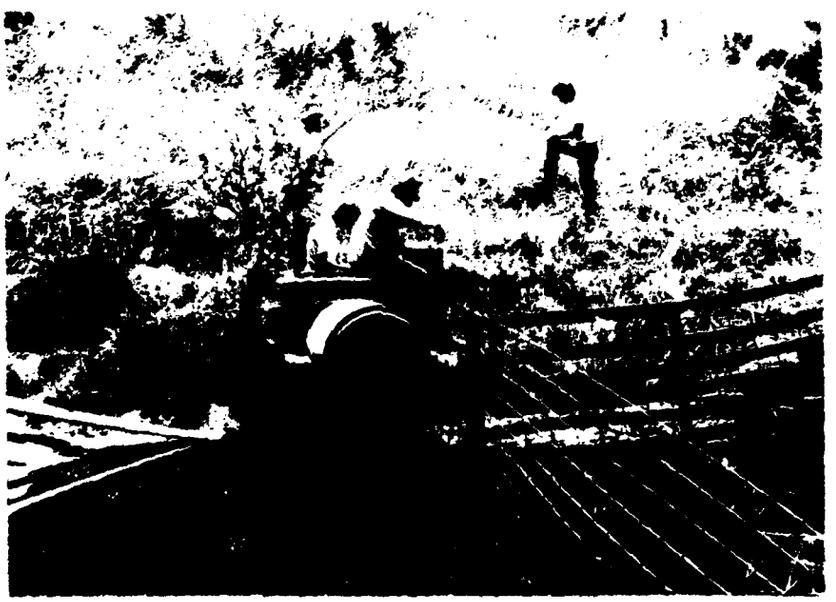


Photo 8

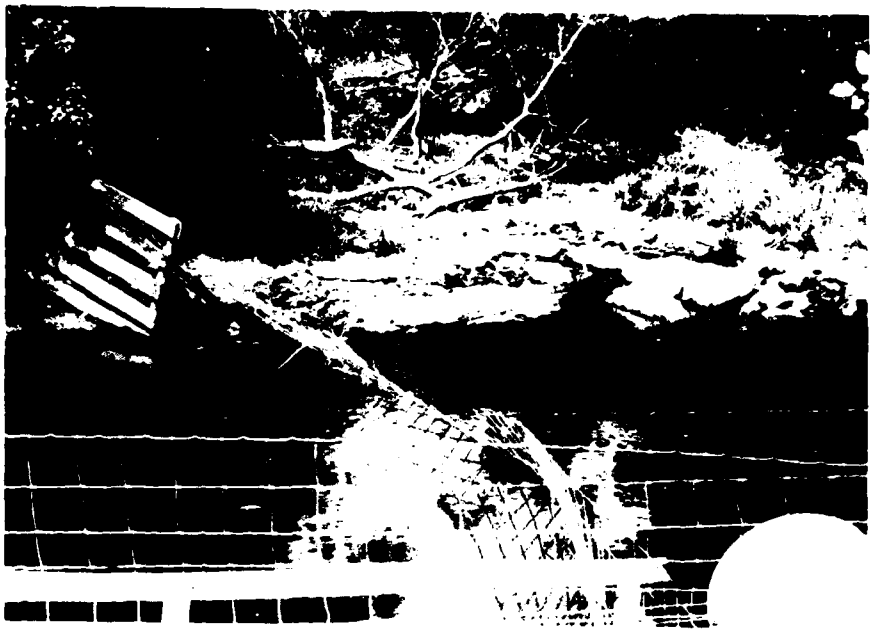
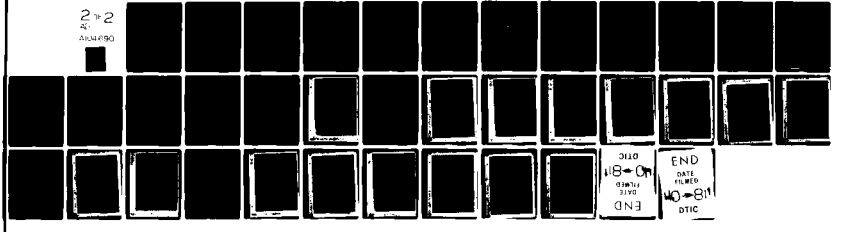


Photo 9

Photo 10

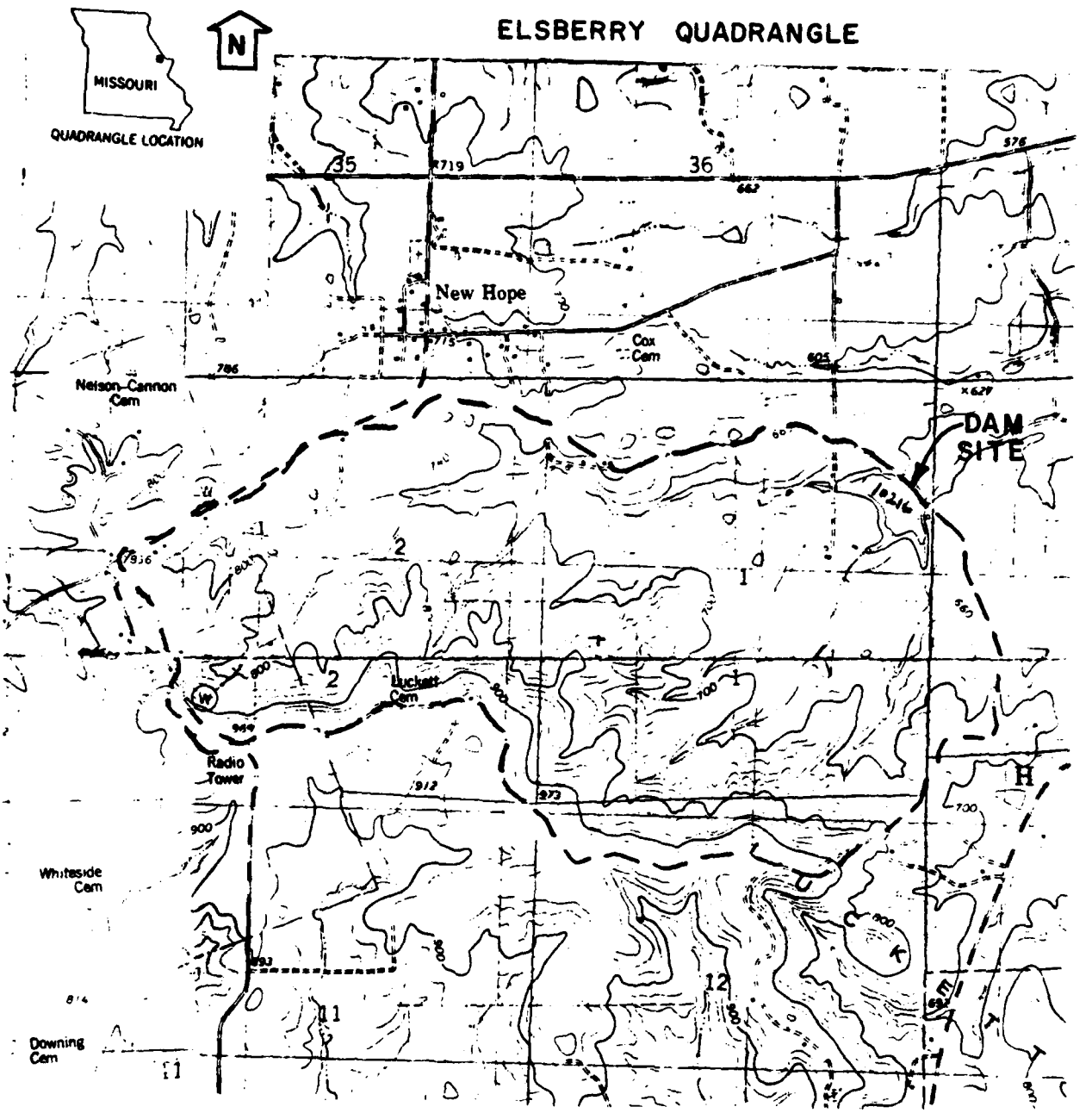
AD-A104 690 CONSOER TOWNSEND AND ASSOCIATES LTD ST LOUIS MO F/G 13/13
NATIONAL DAM SAFETY PROGRAM. RUSSELL TAYLOR DAM (MO 10216), MIS--ETC(U)
SEP 79 W G SHIFRIN DACW43-79-C-0075
UNCLASSIFIED NL



APPENDIX B

HYDROLOGIC COMPUTATIONS

PLATE I, APPENDIX B



SCALE 1 24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

DRAINAGE BOUNDARY — — — — —

RUSSELL TAYLOR DAM (MO 10216)
DRAINAGE BASIN

EC1-4 **ENGINEERING CONSULTANTS, INC.**

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 1 OF

RUSSELL TAYLOR DAM # 10216 — JOB NO. 1240

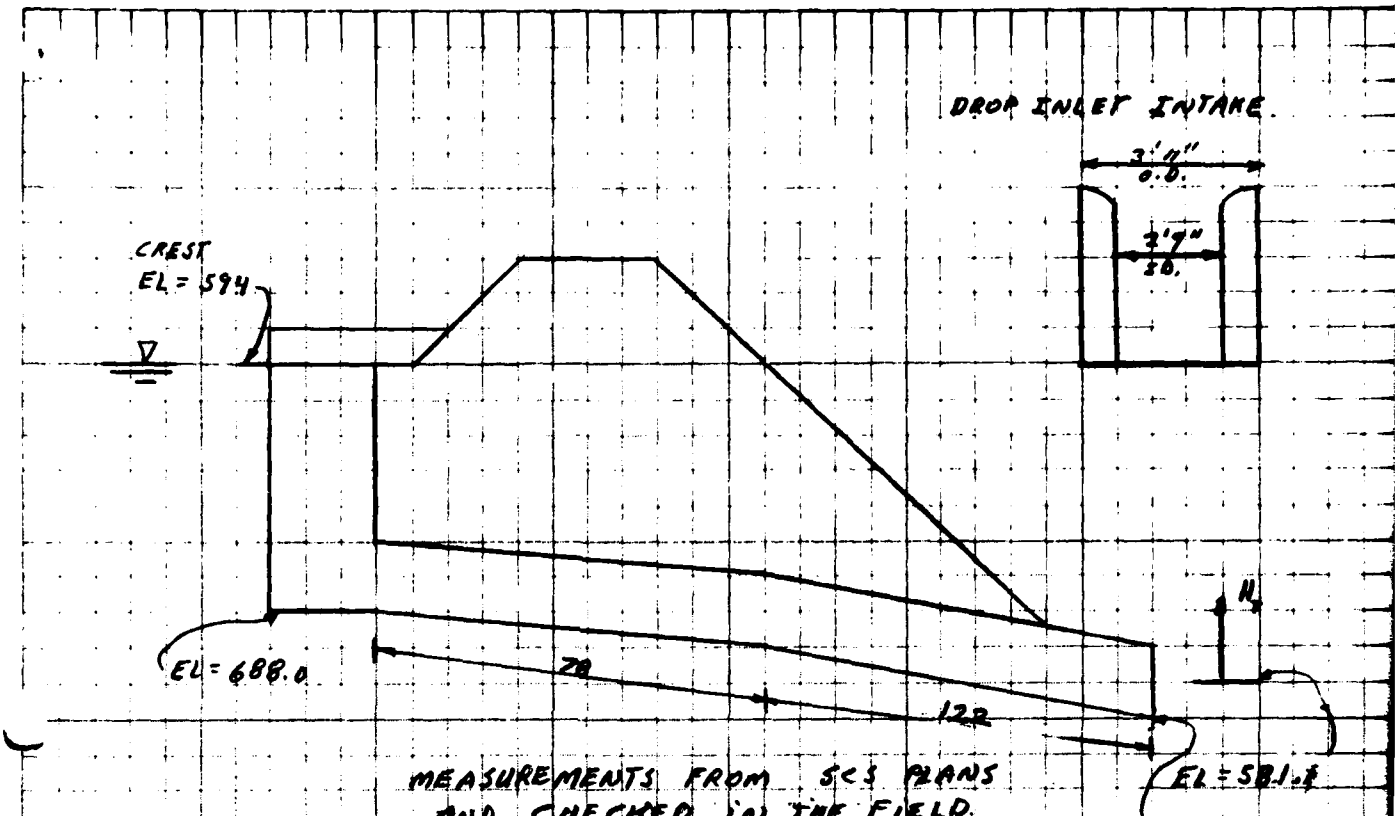
SPILLWAY + OVERTOP RATING CURVE — BY DNH — DATE 6/25/79

HLR 6-26-79

Y4	A4	T4	$V_{c4}=5.67\sqrt{\frac{A_4}{T_4}}$	$\frac{V_{c4}^2}{2g}$	$Q_4=A_4V_4$	V/S W.S. $Y_4+\frac{V_{c4}^2}{2g}$	C_1	L_1	H_1	$Q_1=C_1L_1H_1^{3/2}$	$Q_T=Q_4+Q_1$
0	0	0	0	0	0	**644.5**	-	-	-	-	0
1	113	141	5.5	0.5	619.2	**645**	-	-	-	-	619.2
2	242	137	7.5	0.9	1823.7	646.9	-	-	-	-	1823.7
4	548	169	10.2	1.6	5595.1	650.1	-	-	-	-	5595.1
4.4	6169	1754	10.6	1.7	6539.1	**650.6**	-	-	-	-	6539.1
5	7250	1850	11.2	2.0	8137.7	652.5	2.69	761	.5	723.8	8861.5
5.5	8195	193	11.7	2.1	9574.8	652.1	2.65	761	1.1	2326.6	11,901.4

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 2 OF
RUSSELL TAYLOR DAM (10216) — JOB NO. 1240-001
PRINCIPAL SPILLWAY RATING CURVE — BY MLB DATE 6-21-29



MEASUREMENTS FROM SCS PLANS AND CHECKED IN THE FIELD WHERE POSSIBLE

PRINCIPAL SPILLWAY DISCHARGE (ASSUME NO TAILWATER EFFECTS)

AT W.L = 594.5

a) WEIR FLOW: ASSUME $C = 3.03$

$L = \pi D = \pi \times 3.92 = 12.33$

$H = 594.5 - 594.0 = 0.5$

$Q = CLH^{3/2} = 3.03 \times 12.33 \times 0.5^{3/2} = 13$ CFS

b) CHECK FOR PRESSURE FLOW

$$H_f = \left(1 + K_e + f\frac{L}{D}\right)\frac{v^2}{2g}$$

Assume $\epsilon = 0.005'$, $\frac{\epsilon}{D} = 0.0025 \rightarrow f_1 = 0.025$

Assume $K_e = 0.5$

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 3 OF
RUSSELL TAYLOR DAM (10216) — JOB NO. 1240-001
PRINCIPAL SPILLWAY RATING CURVE — BY KLB DATE 6-21-79

$$H_T = \left(1.0 + 0.5 + 0.0125 \frac{396}{2}\right) \frac{v^2}{2g}$$

$$H_T = 4.00 \frac{v^2}{2g} \Rightarrow v = 4.01 \sqrt{H_T}$$

$$Q = A \cdot V = \pi \frac{2^2}{4} \cdot 4.01 \sqrt{H_T} = \pi \frac{2^2}{4} \cdot 4.01 \sqrt{H_T} = 12.60 \sqrt{H_T}$$

H_T = 594.5 − 582 = 12.5

$Q = 12.60 \sqrt{12.5}$ = 46 CFS

∴ AT ELEV. 594.5 WEIR FLOW CONTROLS

AND Q = 18 CFS

AT W.L. = 595 H = 595 − 594 = 1

a) WEIR FLOW

$Q = CLH^{3/2} = 3.03 \times 12.33 \times 1^{3/2}$ = 37 CFS

b) PRESSURE FLOW H_T = 595 − 581 = 14

$Q = 12.60 \sqrt{H_T} = 12.60 \sqrt{14}$ = 47 CFS

∴ AT W.L. = 595 WEIR FLOW CONTROLS

AND Q = 37 CFS

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION – MISSOURI SHEET NO. 4 OF
RUSSEL TAYLOR DAM (10216) JOB NO. 1240-001
PRINCIPAL SPILLWAY RATING CURVE. BY KLB DATE 6-21-79

AT W.L. = 596 , $H = 569 - 594 = 2$.

a) WEIR FLOW

$Q = CLH^{3/2} = 3.03 \times 17.33 \times 2^{3/2} = 106$ CFS

b) PRESSURE FLOW. $H_f = 596 - 581.2 = 14.8$

$Q = 1260\sqrt{H_f} = 1260\sqrt{14.8} = 49$ CFS.

∴ AT W.L. = 596 PRESSURE FLOW CONTROLS AND Q = 49 CFS.

ALSO FOR ALL ELEVATIONS ABOVE 596 PRESSURE FLOW WILL CONTROL AND THE EQUATION

$Q = 1260\sqrt{H_f}$ WILL BE USED

ECI-4 ENGINEERING CONSULTANTS, INC.

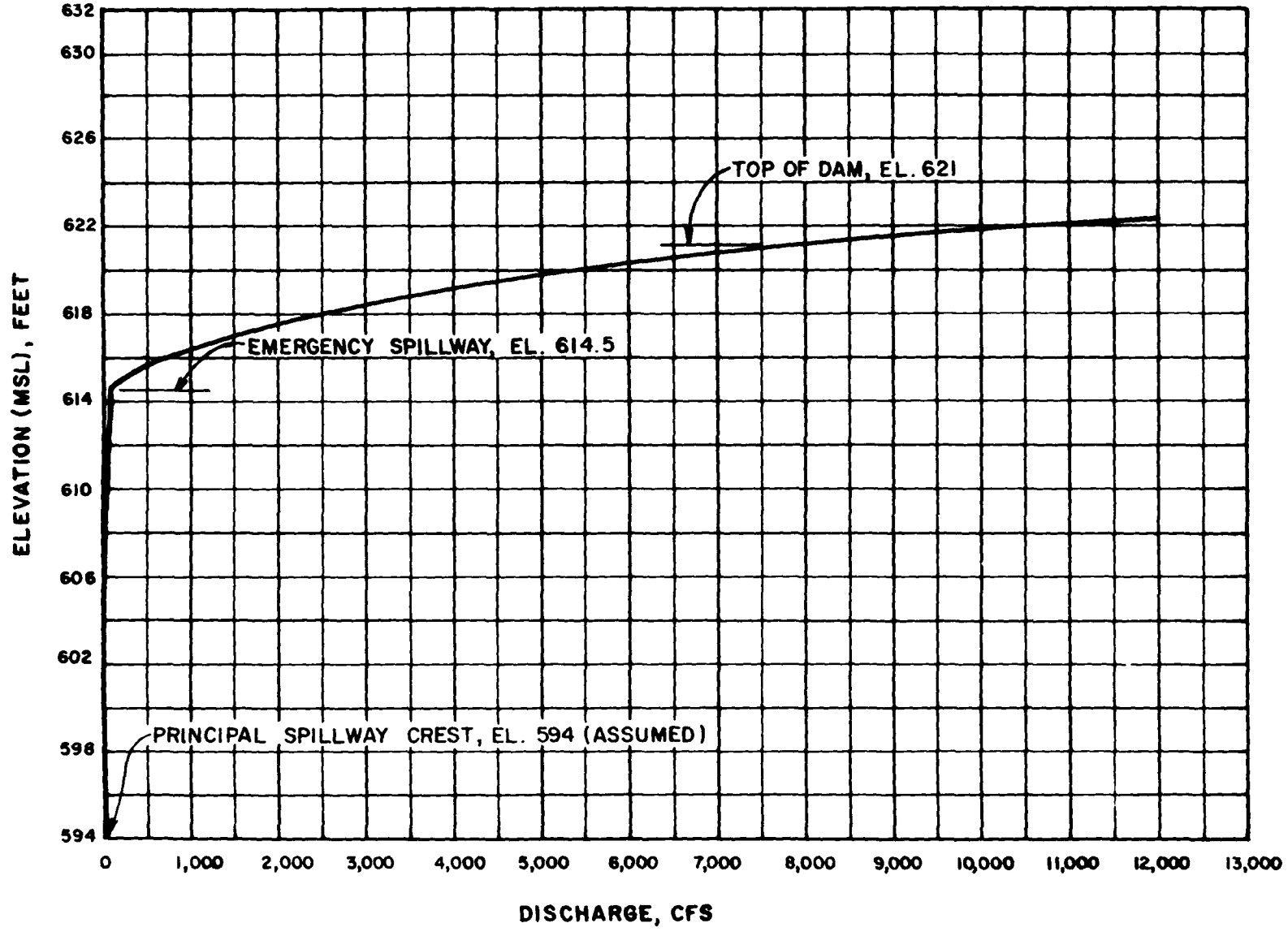
DAM SAFETY INSPECTION - MISSOURI SHEET NO. 4 OF
RUSSELL TAYLOR DAM (10216) JOB NO. 1240-001
SPILLWAY AND OVERTOP RATING CURVE BY KLB DATE 6-21-79

COMBINED RATING CURVE TABULATION

RESERVOIR WATER SURFACE ELEVATION	H_T	PRINCIPAL SPILLWAY DISCHARGE Q=	EMERGENCY SPILLWAY DISCHARGE	DISCHARGE OVER TOP OF DAM	COMBINED DISCHARGE
594.0	13.0	0	–	–	0
594.5	13.5	13*	–	–	13
595.0	14.0	37*	–	–	37
596.0	15.0	49	–	–	49
602.0	21.0	58	–	–	58
608.0	27.0	65	–	–	65
614.5	33.5	73	0	0	73
616	35	75	619	0	694
617.4	36.4	76	1824	0	1900
620.1	39.1	79	5595	0	5674
620.6	39.6	79	6539	0	6618
621.5	40.5	80	8138	724	8942
622.1	41.1	81	9,575	2,327	11983

* WEIR FLOW CONTROLS

RUSSELL TAYLOR DAM (MO. 10216)
SPILLWAY & OVERTOP RATING CURVE



ECI-4 ENGINEERING CONSULTANTS, INC.

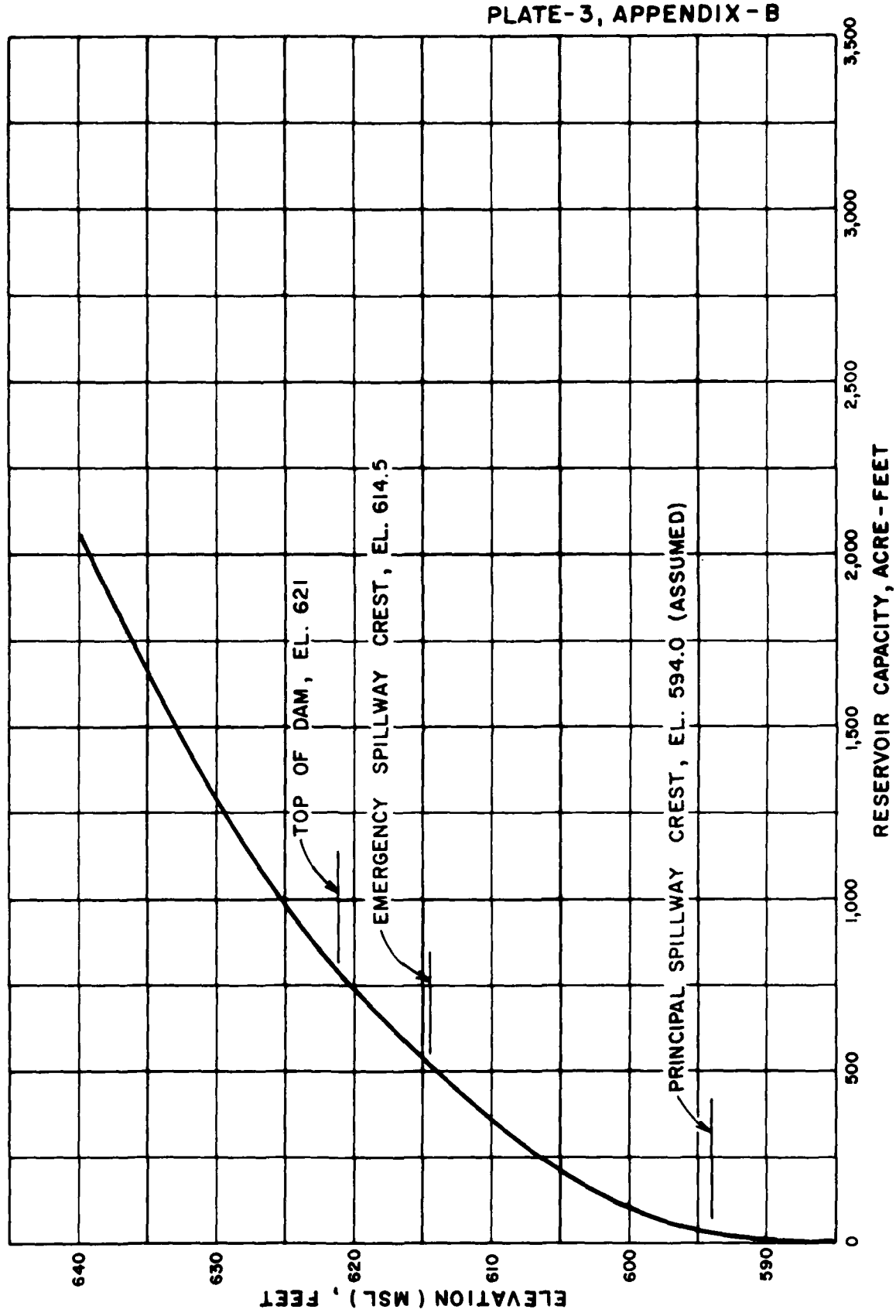
Dam Safety Inspection - Missouri SHEET NO. 1 OF
RUSSELL TAYLOR DAM - #10216 JOB NO. 1240
Reservoir Area Capacity BY M.E.H. DATE 5-30-79

RUSSELL TAYLOR Dam

Reservoir Area Capacity

Elev. M.S.L. (Ft.)	Reservoir Surface Area (Acres)	Incremental Volume (Ac.-Ft.)	Total Volume (Ac.-Ft.)	Remarks
585	0	0	0	Est. Streambed at Dam.
594	10	30.0	30.0	W.S. as shown on USGS maps (Elev. assumed.) ASSUMED SPILLWAY CREST EL.
600	18	82.8	113	AREA MEASURED ON USGS MAP.
614.5	38.5	400	513	EMERGENCY SPILLWAY CREST ELEV.
620	47	235	748	AREA MEASURED ON USGS MAP
621	49	48	796	TOP OF DAM ELEV.
640	86	1266	2062	AREA MEASURED ON USGS MAP

PLATE-3, APPENDIX-B



RUSSELL TAYLOR DAM (MO. 10216)
RESERVOIR CAPACITY CURVE

DAM # MO. 10216

DETERMINATION OF PMP

1. DETERMINE DRAINAGE AREA OF THE BASIN

D. A. = 1056 ACRES

2. DETERMINE PMP INDEX RAINFALL (200 SQ. MI. + 24 HRS DUR.)

LOCATION OF CENTROID OF BASIN

LONG = 90° 51' 21" LAT. = 39° 07' 33"

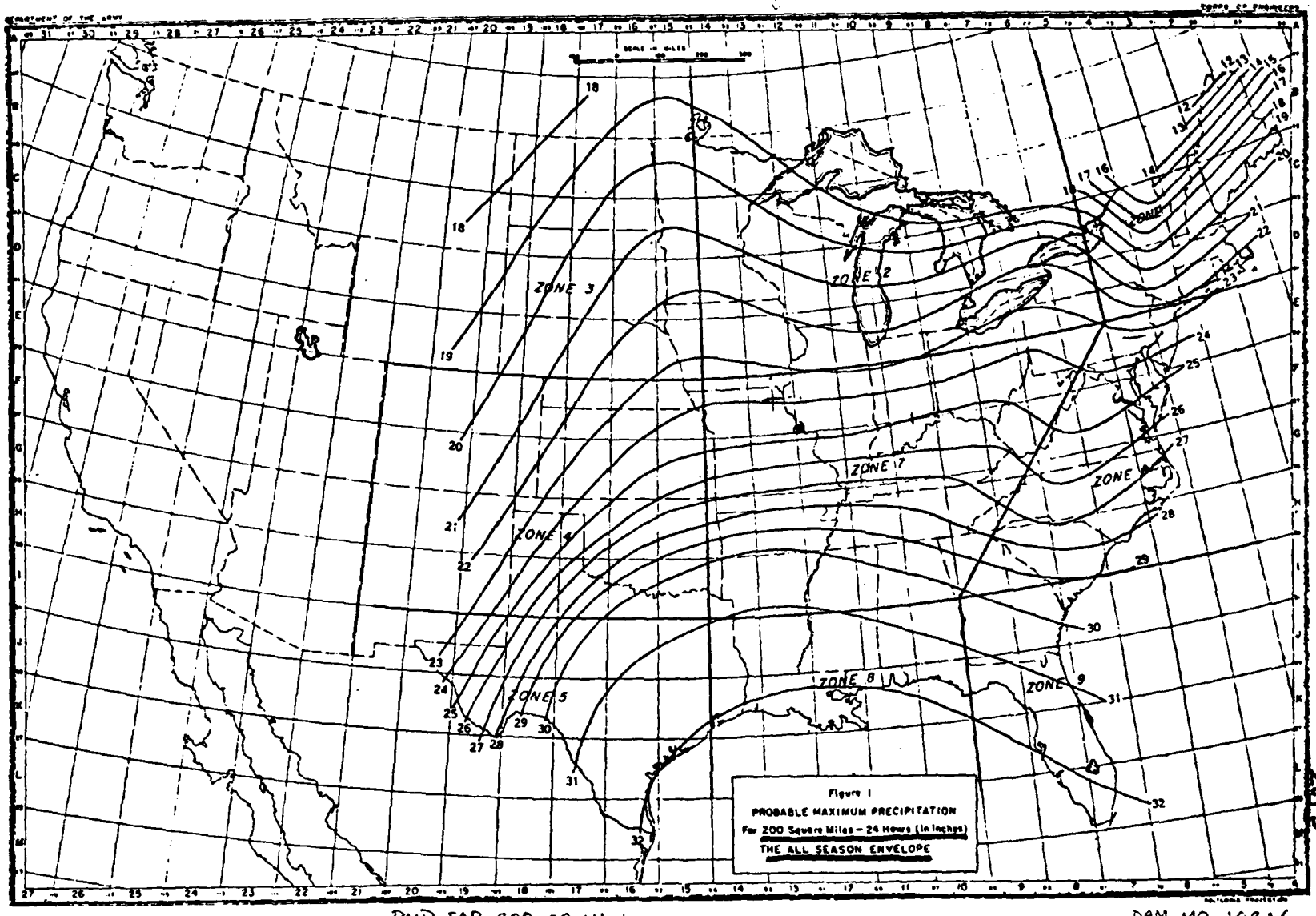
→ PMP = 24.7" (From Fig. 1, HMR #33)

3. DETERMINE BASIN RAINFALL IN TERMS OF PERCENTAGE OF PMP INDEX RAINFALL FOR VARIOUS DURATIONS:

LOCATION LONG. = 90° 51' 21" LAT. = 39° 07' 33"

⇒ ZONE 7

DURATION (HRS.)	PERCENT OF INDEX RAINFALL	TOTAL RAINFALL (INCHES)	RAINFALL INCREMENTS (INCHES)	DURATION OF INCREMENTS (HRS.)
6	100	24.7	24.7	6
12	120	29.6	4.9	6
24	130	32.1	2.5	12



PMP FOR 200 SQ. MI. &
24 HRS DURATION = 24.7"

DAM NO. 10216
LOCATION OF CENTROID
OF WATERSHED:
LAT. 39°07'33 LONG 90°51'21"

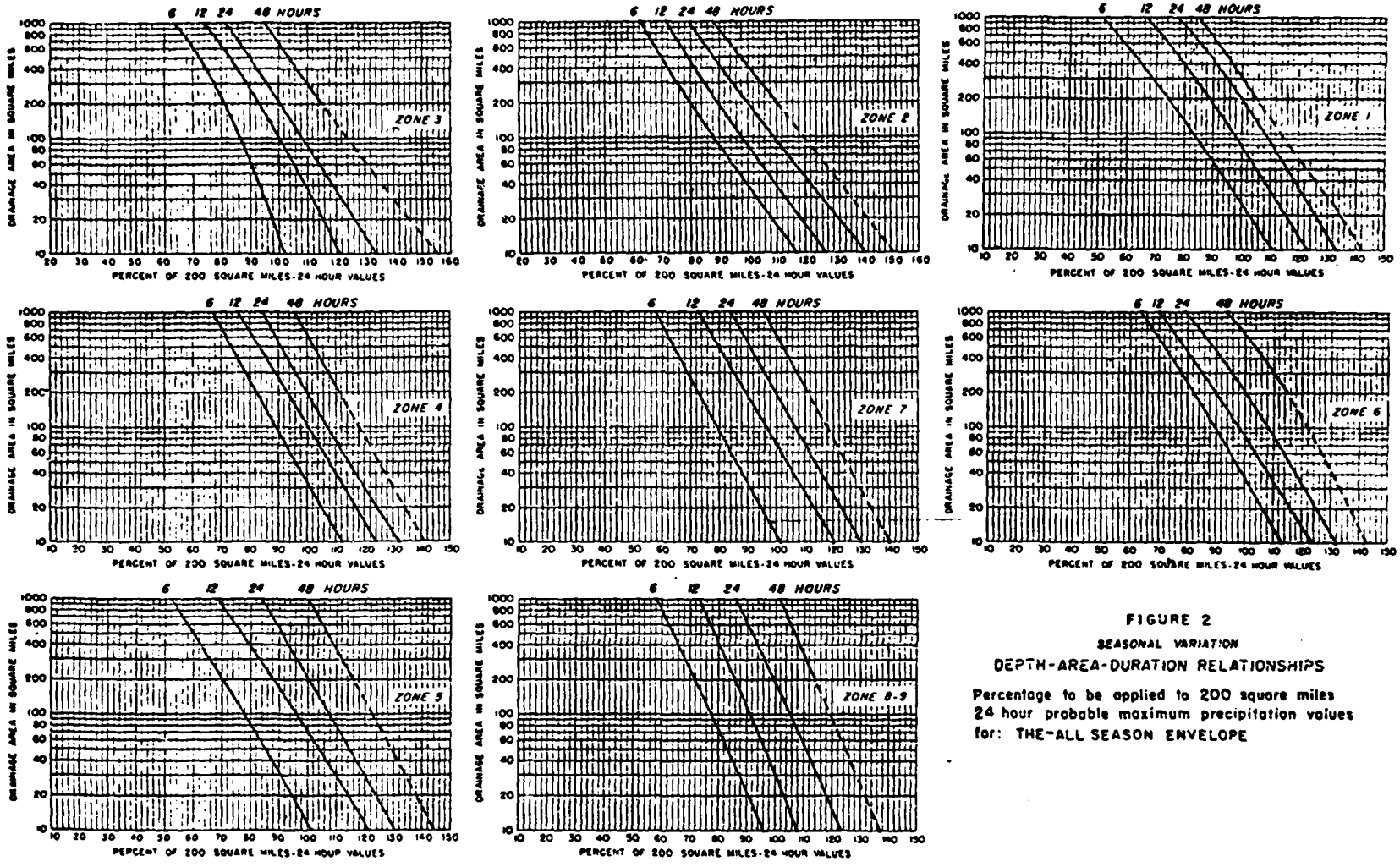


FIGURE 2

SEASONAL VARIATION

DEPTH-AREA-DURATION RELATIONSHIPS

Percentage to be applied to 200 square miles 24 hour probable maximum precipitation values for: THE-ALL SEASON ENVELOPE

ECI-4 **ENGINEERING CONSULTANTS, INC.**

DAM SAFETY INSPECTION - MISSOURI — SHEET NO. 1 OF 1

DAM # MO. 10216 — JOB NO. 1240

UNIT HYDROGRAPH PARAMETERS — BY DNZ ✓MAG — DATE 6/11/79

1. DRAINAGE AREA, $A = 1056$ ACRES $= 1.65$ SQ. MI.

2. LENGTH OF STREAM, $L = 1.98$ MI. $= 10,454$ FT.

3. ELEVATION AT DRAINAGE DIVIDE ALONG LONGEST STREAM

$H_1 = 960$ FT.

4. RESERVOIR ELEVATION AT SPILLWAY CREST, $H_2 = 594$

5. DIFFERENCE IN ELEVATION, $\Delta H = 366$ FT.

6. AVERAGE SLOPE OF STREAM $= \frac{\Delta H}{L} = \frac{366}{10,454} = 3.50\%$

7. TIME OF CONCENTRATION:

a) BY KIRPICH FORMULA:

$$T_c = \left(\frac{11.9 \times L^3}{\Delta H}\right)^{0.385} = \left(\frac{11.9 \times 1.98^3}{366}\right)^{0.385} = 0.59 \text{ HR}$$

b) BY VELOCITY ESTIMATE: AVG VEL = 3 CFS

$$T_c = \frac{L}{V} = \frac{10,454 \text{ Ft}}{3(60 \times 60)} = 0.97 \text{ HR}$$

USE $T_c = 0.59$ HR

8. LAG TIME, $L_t = 0.6 \times 0.59 = 0.35$ HR.

9. UNIT DURATION, $D \leq \frac{L_t}{3} = \frac{0.35}{3} = 0.118 > 0.083$

USE $D = 0.083$

10. TIME TO PEAK, $T_p = \frac{D}{2} + L_t = \frac{0.083}{2} + 0.35 = 0.392$

11. PEAK DISCHARGE, $q_p = \frac{484 A}{T_p} = \frac{484(1.65)}{0.392}$

$q_p = 2037$ CFS

RUSSELL TAYLOR DAM (MO. 10216)

DETERMINATION OF HYDROLOGIC SOIL GROUP & CURVE NUMBER

1. Watershed soils consist of Group B, C, and D soils. Group C soil seems to be predominent. Assume Group C for the entire watershed.

2. About 50 percent of the watershed appears to be agricultural land and the rest is wooded and covered with grass. Assume the hydrologic condition of the watershed as "Fair"

Thus $CN = \frac{73+82}{2} \simeq 78$ for AMC-II

$\Rightarrow CN = 90$ for AMC-III

ECI-4 ENGINEERING CONSULTANTS, INC.

DAM SAFETY INSPECTION - MISSOURI SHEET NO. 1 OF

RUSSELL TAYLOR DAM (#10216) JOB NO. 1240-001

100 YR FLOOD BY REGRESSION EQUATION BY KLB DATE 6-27-7; MAH

RUSSELL TAYLOR DAM

100 YR FLOOD BY REGRESSION EQUATION

REGRESSION EQUATION FOR THE 100-YR FLOOD FOR MISSOURI:

$$Q_{100} = 85.1\, A^{0.934\, A^{-0.02}}\, S^{0.576}$$

WHERE

A = DRAINAGE AREA IN SQ. MI.

S = MAIN CHANNEL SLOPE FT/MI (AVG. SLOPE BETWEEN 0.1L AND 0.85L)

FOR RUSSELL TAYLOR DAM:

A = 1.65 SQ. MI.

S = 106 FT/MI.

$$Q_{100} = 85.1\, (1.65)^{0.934\, (1.65)^{-0.02}}\, (106)^{0.576}$$

Q_{100} = 1984 CFS.

HEC1DB INPUT DATA

```
*************************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
LAST MODIFICATION  26 FEB 79
*************************************
A                    DAM SAFETY INSPECTION - MISSOURI
A                      RUSSELL TAYLOR DAM (10216)
A                PMF AND 50 PERCENT PMF DETERMINATION AND ROUTING
B     300       0       5       0       0       0       0       0       0       0
B1      5
J       1       2       1
J1      1     0.5
K       0   10215                                   1
K1  INPUT PRECIPITAION INDEX, RATIOS, AND UNIT HYDROGRAPH PARAMETERS
M       1       2    1.65            1.65     1.0
P            24.7     100     120     130
T                                                  -1     -90
W2           0.35
X       0       0       1
K       1   10216                   2               1
K1  ROUTE HYDROGRAPH THROUGH RUSSELL TAYLOR DAM (10216)
Y                               1       1
Y1      1                                        -594      -1
Y4    594   594.5     595     596     602     608   614.5     616   617.4   620.1
Y4  620.6     621   621.5   622.1
Y5      0      13      37      49      58      65      73     694    1900    5674
Y5   6618    7654    8942   11983
$S      0      33     113     513     748     796    2062
$E    585     594     600   614.5     620     621     640
$$    594
$D    621
K      99
```

INFLOW PMF AND ONE-HALF PMF HYDROGRAPHS

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 10216
ROUTE HYDROGRAPH TO 10216
END OF NETWORK

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
  LAST MODIFICATION  26 FEB 79
**********

RUN  DATE= 79/07/17.
     TIME= 07.32.38.
```

DAM SAFETY INSPECTION - MISSOURI
RUSSELL TAYLOR DAM (10816)
PMF AND 50 PERCENT PMF DETERMINATION AND ROUTING

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	5	0	0	0	0	0	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 2 LRTIO= 1

RTIOS= 1.00 .50

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INPUT PRECIPITAION INDEX, RATIOS, AND UNIT HYDROGRAPH PARAMETERS

ICSTAQ	ICOMP	IECON	ITAPE	JPLT	JPPT	INAME	ISTAGE	IAUTO
10816	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	1.65	0.00	1.65	1.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.70	100.00	120.00	130.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-90.00	0.00	0.00

CURVE NO = -90.00 WETNESS = -1.00 EFFECT CN = 98.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .35

RECESSION DATA
STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

UNIT HYDROGRAPH 23 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= .35 VOL= 1.00

287.	714.	1469.	1956.	2073.	1780.	1404.	930.	657.	475.
336.	237.	167.	117.	83.	59.	42.	29.	21.	16.

81. 6. 8.

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	END-OF-PERIOD FLOW COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.05	1	.01	0.00	.01	0.	1.01	12.35	151	.21	.20	.00	2140.
1.01	.10	2	.01	0.00	.01	0.	1.01	12.40	152	.21	.20	.00	2267.
1.01	.15	3	.01	0.00	.01	0.	1.01	12.45	153	.21	.20	.00	2358.
1.01	.20	4	.01	0.00	.01	0.	1.01	12.50	154	.21	.20	.00	2424.
1.01	.25	5	.01	0.00	.01	0.	1.01	12.55	155	.21	.20	.00	2471.
1.01	.30	6	.01	0.00	.01	0.	1.01	13.00	156	.21	.20	.00	2505.
1.01	.35	7	.01	0.00	.01	0.	1.01	13.05	157	.25	.24	.00	2539.
1.01	.40	8	.01	0.00	.01	0.	1.01	13.10	158	.25	.24	.00	2586.
1.01	.45	9	.01	0.00	.01	0.	1.01	13.15	159	.25	.24	.00	2659.
1.01	.50	10	.01	0.00	.01	0.	1.01	13.20	160	.25	.24	.00	2708.
1.01	.55	11	.01	0.00	.01	0.	1.01	13.25	161	.25	.24	.00	2838.
1.01	1.00	12	.01	0.00	.01	0.	1.01	13.30	162	.25	.24	.00	2916.
1.01	1.05	13	.01	0.00	.01	0.	1.01	13.35	163	.25	.24	.00	2978.
1.01	1.10	14	.01	0.00	.01	0.	1.01	13.40	164	.25	.24	.00	3020.
1.01	1.15	15	.01	0.00	.01	0.	1.01	13.45	165	.25	.24	.00	3050.
1.01	1.20	16	.01	0.00	.01	0.	1.01	13.50	166	.25	.24	.00	3072.
1.01	1.25	17	.01	.00	.01	0.	1.01	13.55	167	.25	.24	.00	3087.
1.01	1.30	18	.01	.00	.01	0.	1.01	14.00	168	.25	.24	.00	3099.
1.01	1.35	19	.01	.00	.01	1.	1.01	14.05	169	.31	.31	.00	3121.
1.01	1.40	20	.01	.00	.01	2.	1.01	14.10	170	.31	.31	.00	3171.
1.01	1.45	21	.01	.00	.01	3.	1.01	14.15	171	.31	.31	.00	3265.
1.01	1.50	22	.01	.00	.01	5.	1.01	14.20	172	.31	.31	.00	3389.
1.01	1.55	23	.01	.00	.01	8.	1.01	14.25	173	.31	.31	.00	3516.
1.01	2.00	24	.01	.00	.01	11.	1.01	14.30	174	.31	.31	.00	3628.
1.01	2.05	25	.01	.00	.01	14.	1.01	14.35	175	.31	.31	.00	3716.
1.01	2.10	26	.01	.00	.01	18.	1.01	14.40	176	.31	.31	.00	3775.
1.01	2.15	27	.01	.00	.01	21.	1.01	14.45	177	.31	.31	.00	3817.
1.01	2.20	28	.01	.00	.01	24.	1.01	14.50	178	.31	.31	.00	3847.
1.01	2.25	29	.01	.00	.01	27.	1.01	14.55	179	.31	.31	.00	3869.
1.01	2.30	30	.01	.00	.01	31.	1.01	15.00	180	.31	.31	.00	3885.
1.01	2.35	31	.01	.00	.01	34.	1.01	15.05	181	.19	.19	.00	3869.
1.01	2.40	32	.01	.00	.01	37.	1.01	15.10	182	.38	.37	.00	3833.
1.01	2.45	33	.01	.00	.01	40.	1.01	15.15	183	.38	.37	.00	3796.
1.01	2.50	34	.01	.00	.01	43.	1.01	15.20	184	.56	.56	.00	3881.
1.01	2.55	35	.01	.00	.01	45.	1.01	15.25	185	.66	.65	.00	4161.
1.01	3.00	36	.01	.00	.01	48.	1.01	15.30	186	1.60	1.59	.01	4881.
1.01	3.05	37	.01	.00	.01	51.	1.01	15.35	187	2.63	2.62	.01	6452.
1.01	3.10	38	.01	.01	.01	53.	1.01	15.40	188	1.03	1.03	.00	8915.
1.01	3.15	39	.01	.01	.01	56.	1.01	15.45	189	.66	.66	.00	11656.
1.01	3.20	40	.01	.01	.01	58.	1.01	15.50	190	.66	.66	.00	13436.
1.01	3.25	41	.01	.01	.01	60.	1.01	15.55	191	.38	.37	.00	13775.
1.01	3.30	42	.01	.01	.01	63.	1.01	16.00	192	.38	.37	.00	12953.
1.01	3.35	43	.01	.01	.01	65.	1.01	16.05	193	.29	.29	.00	11376.
1.01	3.40	44	.01	.01	.01	67.	1.01	16.10	194	.29	.29	.00	9555.
1.01	3.45	45	.01	.01	.01	69.	1.01	16.15	195	.29	.29	.00	8079.
1.01	3.50	46	.01	.01	.01	71.	1.01	16.20	196	.29	.29	.00	6914.
1.01	3.55	47	.01	.01	.01	73.	1.01	16.25	197	.29	.29	.00	5996.
1.01	4.00	48	.01	.01	.01	75.	1.01	16.30	198	.29	.29	.00	5224.
1.01	4.05	49	.01	.01	.01	77.	1.01	16.35	199	.29	.29	.00	4635.
1.01	4.10	50	.01	.01	.01	79.	1.01	16.40	200	.29	.29	.00	4408.
1.01	4.15	51	.01	.01	.01	80.	1.01	16.45	201	.29	.29	.00	4253.
1.01	4.20	52	.01	.01	.01	82.	1.01	16.50	202	.29	.29	.00	4084.
1.01	4.25	53	.01	.01	.01	84.	1.01	16.55	203	.29	.29	.00	3964.
1.01	4.30	54	.01	.01	.01	85.	1.01	17.00	204	.29	.29	.00	3880.
1.01	4.35	55	.01	.01	.01	87.	1.01	17.05	205	.23	.23	.00	3808.

1.01	4.40	86	.01	.01	.01	88.	1.01	17.10	206	.23	.23	.00	3722.
1.01	4.45	87	.01	.01	.01	90.	1.01	17.15	207	.23	.23	.00	3597.
1.01	4.50	88	.01	.01	.01	91.	1.01	17.20	208	.23	.23	.00	3449.
1.01	4.55	89	.01	.01	.01	93.	1.01	17.25	209	.23	.23	.00	3303.
1.01	5.00	60	.01	.01	.01	94.	1.01	17.30	210	.23	.23	.00	3181.
1.01	5.05	61	.01	.01	.01	96.	1.01	17.35	211	.23	.23	.00	3089.
1.01	5.10	62	.01	.01	.01	97.	1.01	17.40	212	.23	.23	.00	3029.
1.01	5.15	63	.01	.01	.01	98.	1.01	17.45	213	.23	.23	.00	2967.
1.01	5.20	64	.01	.01	.01	99.	1.01	17.50	214	.23	.23	.00	2957.
1.01	5.25	65	.01	.01	.01	101.	1.01	17.55	215	.23	.23	.00	2936.
1.01	5.30	66	.01	.01	.01	102.	1.01	18.00	216	.23	.23	.00	2922.
1.01	5.35	67	.01	.01	.01	103.	1.01	18.05	217	.02	.02	.00	2865.
1.01	5.40	68	.01	.01	.01	104.	1.01	18.10	218	.02	.02	.00	2711.
1.01	5.45	69	.01	.01	.01	105.	1.01	18.15	219	.02	.02	.00	2404.
1.01	5.50	70	.01	.01	.00	106.	1.01	18.20	220	.02	.02	.00	1998.
1.01	5.55	71	.01	.01	.00	107.	1.01	18.25	221	.02	.02	.00	1580.
1.01	6.00	72	.01	.01	.00	108.	1.01	18.30	222	.02	.02	.00	1211.
1.01	6.05	73	.07	.05	.02	118.	1.01	18.35	223	.02	.02	.00	921.
1.01	6.10	74	.07	.05	.02	145.	1.01	18.40	224	.02	.02	.00	728.
1.01	6.15	75	.07	.05	.02	201.	1.01	18.45	225	.02	.02	.00	592.
1.01	6.20	76	.07	.05	.02	277.	1.01	18.50	226	.02	.02	.00	474.
1.01	6.25	77	.07	.05	.02	357.	1.01	18.55	227	.02	.02	.00	425.
1.01	6.30	78	.07	.05	.02	432.	1.01	19.00	228	.02	.02	.00	376.
1.01	6.35	79	.07	.05	.02	494.	1.01	19.05	229	.02	.02	.00	342.
1.01	6.40	80	.07	.05	.01	541.	1.01	19.10	230	.02	.02	.00	318.
1.01	6.45	81	.07	.05	.01	577.	1.01	19.15	231	.02	.02	.00	301.
1.01	6.50	82	.07	.06	.01	607.	1.01	19.20	232	.02	.02	.00	289.
1.01	6.55	83	.07	.06	.01	632.	1.01	19.25	233	.02	.02	.00	280.
1.01	7.00	84	.07	.06	.01	652.	1.01	19.30	234	.02	.02	.00	274.
1.01	7.05	85	.07	.06	.01	669.	1.01	19.35	235	.02	.02	.00	270.
1.01	7.10	86	.07	.06	.01	683.	1.01	19.40	236	.02	.02	.00	267.
1.01	7.15	87	.07	.06	.01	696.	1.01	19.45	237	.02	.02	.00	264.
1.01	7.20	88	.07	.06	.01	707.	1.01	19.50	238	.02	.02	.00	263.
1.01	7.25	89	.07	.06	.01	717.	1.01	19.55	239	.02	.02	.00	263.
1.01	7.30	90	.07	.06	.01	726.	1.01	20.00	240	.02	.02	.00	263.
1.01	7.35	91	.07	.06	.01	734.	1.01	20.05	241	.02	.02	.00	263.
1.01	7.40	92	.07	.06	.01	741.	1.01	20.10	242	.02	.02	.00	263.
1.01	7.45	93	.07	.06	.01	748.	1.01	20.15	243	.02	.02	.00	263.
1.01	7.50	94	.07	.06	.01	754.	1.01	20.20	244	.02	.02	.00	263.
1.01	7.55	95	.07	.06	.01	760.	1.01	20.25	245	.02	.02	.00	263.
1.01	8.00	96	.07	.06	.01	765.	1.01	20.30	246	.02	.02	.00	263.
1.01	8.05	97	.07	.06	.01	770.	1.01	20.35	247	.02	.02	.00	263.
1.01	8.10	98	.07	.06	.01	774.	1.01	20.40	248	.02	.02	.00	263.
1.01	8.15	99	.07	.06	.01	778.	1.01	20.45	249	.02	.02	.00	263.
1.01	8.20	100	.07	.06	.01	782.	1.01	20.50	250	.02	.02	.00	263.
1.01	8.25	101	.07	.06	.01	786.	1.01	20.55	251	.02	.02	.00	263.
1.01	8.30	102	.07	.06	.01	789.	1.01	21.00	252	.02	.02	.00	263.
1.01	8.35	103	.07	.06	.01	793.	1.01	21.05	253	.02	.02	.00	263.
1.01	8.40	104	.07	.06	.01	796.	1.01	21.10	254	.02	.02	.00	263.
1.01	8.45	105	.07	.06	.01	799.	1.01	21.15	255	.02	.02	.00	263.
1.01	8.50	106	.07	.06	.00	802.	1.01	21.20	256	.02	.02	.00	263.
1.01	8.55	107	.07	.06	.00	804.	1.01	21.25	257	.02	.02	.00	263.
1.01	9.00	108	.07	.06	.00	807.	1.01	21.30	258	.02	.02	.00	263.
1.01	9.05	109	.07	.06	.00	809.	1.01	21.35	259	.02	.02	.00	263.
1.01	9.10	110	.07	.06	.00	811.	1.01	21.40	260	.02	.02	.00	263.
1.01	9.15	111	.07	.06	.00	813.	1.01	21.45	261	.02	.02	.00	263.
1.01	9.20	112	.07	.06	.00	815.	1.01	21.50	262	.02	.02	.00	263.
1.01	9.25	113	.07	.06	.00	817.	1.01	21.55	263	.02	.02	.00	263.
1.01	9.30	114	.07	.06	.00	819.	1.01	22.00	264	.02	.02	.00	263.
1.01	9.35	115	.07	.06	.00	821.	1.01	22.05	265	.02	.02	.00	263.

1.01	9.40	116	.07	.07	.00	824.	1.01	22.10	266	.02	.02	.00	263.
1.01	9.45	117	.07	.07	.00	825.	1.01	22.15	267	.02	.02	.00	263.
1.01	9.50	118	.07	.07	.00	826.	1.01	22.20	268	.02	.02	.00	263.
1.01	9.55	119	.07	.07	.00	827.	1.01	22.25	269	.02	.02	.00	263.
1.01	10.00	120	.07	.07	.00	829.	1.01	22.30	270	.02	.02	.00	263.
1.01	10.05	121	.07	.07	.00	830.	1.01	22.35	271	.02	.02	.00	263.
1.01	10.10	122	.07	.07	.00	831.	1.01	22.40	272	.02	.02	.00	263.
1.01	10.15	123	.07	.07	.00	833.	1.01	22.45	273	.02	.02	.00	263.
1.01	10.20	124	.07	.07	.00	834.	1.01	22.50	274	.02	.02	.00	263.
1.01	10.25	125	.07	.07	.00	835.	1.01	22.55	275	.02	.02	.00	263.
1.01	10.30	126	.07	.07	.00	836.	1.01	23.00	276	.02	.02	.00	263.
1.01	10.35	127	.07	.07	.00	837.	1.01	23.05	277	.02	.02	.00	263.
1.01	10.40	128	.07	.07	.00	838.	1.01	23.10	278	.02	.02	.00	263.
1.01	10.45	129	.07	.07	.00	839.	1.01	23.15	279	.02	.02	.00	263.
1.01	10.50	130	.07	.07	.00	840.	1.01	23.20	280	.02	.02	.00	263.
1.01	10.55	131	.07	.07	.00	841.	1.01	23.25	281	.02	.02	.00	263.
1.01	11.00	132	.07	.07	.00	842.	1.01	23.30	282	.02	.02	.00	263.
1.01	11.05	133	.07	.07	.00	843.	1.01	23.35	283	.02	.02	.00	263.
1.01	11.10	134	.07	.07	.00	843.	1.01	23.40	284	.02	.02	.00	263.
1.01	11.15	135	.07	.07	.00	844.	1.01	23.45	285	.02	.02	.00	263.
1.01	11.20	136	.07	.07	.00	845.	1.01	23.50	286	.02	.02	.00	263.
1.01	11.25	137	.07	.07	.00	846.	1.01	23.55	287	.02	.02	.00	263.
1.01	11.30	138	.07	.07	.00	846.	1.02	0.00	288	.02	.02	.00	263.
1.01	11.35	139	.07	.07	.00	847.	1.02	.05	289	0.00	0.00	0.00	258.
1.01	11.40	140	.07	.07	.00	848.	1.02	.10	290	0.00	0.00	0.00	248.
1.01	11.45	141	.07	.07	.00	848.	1.02	.15	291	0.00	0.00	0.00	218.
1.01	11.50	142	.07	.07	.00	849.	1.02	.20	292	0.00	0.00	0.00	173.
1.01	11.55	143	.07	.07	.00	849.	1.02	.25	293	0.00	0.00	0.00	131.
1.01	12.00	144	.07	.07	.00	850.	1.02	.30	294	0.00	0.00	0.00	95.
1.01	12.05	145	.21	.20	.01	881.	1.02	.35	295	0.00	0.00	0.00	66.
1.01	12.10	146	.21	.20	.01	977.	1.02	.40	296	0.00	0.00	0.00	46.
1.01	12.15	147	.21	.20	.00	1174.	1.02	.45	297	0.00	0.00	0.00	33.
1.01	12.20	148	.21	.20	.00	1437.	1.02	.50	298	0.00	0.00	0.00	23.
1.01	12.25	149	.21	.20	.00	1709.	1.02	.55	299	0.00	0.00	0.00	16.
1.01	12.30	150	.21	.20	.00	1950.	1.02	1.00	300	0.00	0.00	0.00	11.
									SUM	32.11	30.81	1.30	393526.
										(816.)	(783.)	(33.)	(11143.42)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13775.	4287.	1366.	1312.	393497.
CMS	390.	121.	39.	37.	11143.
INCHES		24.17	30.81	30.91	30.81
MM		613.90	782.62	782.62	782.62
AC-FT		2126.	2710.	2710.	2710.
THOUS CU M		2622.	3343.	3343.	3343.

HYDROGRAPH AT STA 10216 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	2.
3.	5.	8.	11.	14.	18.	21.	24.	27.	31.
34.	37.	40.	43.	45.	48.	51.	53.	56.	58.
60.	63.	65.	67.	69.	71.	73.	75.	77.	79.
80.	82.	84.	85.	87.	88.	90.	91.	93.	94.
96.	97.	98.	99.	101.	102.	103.	104.	105.	106.
107.	108.	110.	145.	201.	277.	357.	432.	494.	541.
577.	607.	632.	652.	669.	683.	696.	707.	717.	726.
734.	741.	748.	754.	760.	765.	770.	774.	778.	782.

786.	789.	793.	795.	799.	808.	806.	807.	809.	811.
813.	816.	817.	819.	821.	823.	824.	826.	827.	829.
830.	831.	833.	834.	835.	836.	837.	838.	839.	840.
841.	842.	843.	843.	844.	845.	846.	846.	847.	848.
848.	849.	849.	850.	881.	977.	1174.	1437.	1709.	1950.
2140.	2267.	2358.	2424.	2471.	2505.	2539.	2586.	2659.	2748.
2838.	2916.	2978.	3020.	3050.	3072.	3087.	3099.	3121.	3171.
3265.	3349.	3516.	3629.	3710.	3775.	3817.	3847.	3869.	3885.
3869.	3833.	3796.	3881.	4161.	4881.	6452.	8915.	11656.	13456.
13775.	12953.	11376.	9555.	8079.	6914.	5996.	5324.	4835.	4492.
4253.	4084.	3964.	3880.	3808.	3722.	3597.	3449.	3303.	3181.
3089.	3029.	2987.	2957.	2936.	2922.	2865.	2711.	2484.	1998.
1580.	1211.	921.	728.	592.	494.	425.	376.	342.	316.
301.	289.	280.	274.	270.	267.	264.	283.	263.	263.
263.	263.	263.	263.	263.	263.	263.	283.	263.	263.
263.	263.	263.	263.	263.	263.	263.	263.	263.	263.
263.	263.	263.	263.	263.	263.	263.	263.	263.	283.
263.	263.	263.	263.	263.	263.	263.	263.	263.	263.
263.	263.	263.	263.	263.	263.	263.	263.	258.	248.
213.	173.	131.	99.	66.	46.	33.	23.	16.	11.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	13775.	4287.	1366.	1312.	393497.
CMS	390.	121.	39.	37.	11143.
INCHES		24.17	30.81	30.81	30.81
MM		613.90	782.62	782.62	782.62
AC-FT		2126.	2710.	2710.	2710.
THOUS CU M		2622.	3343.	3343.	3343.

HYDROGRAPH AT STA 10216 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
2.	3.	4.	6.	7.	9.	10.	12.	14.	15.
17.	18.	20.	21.	23.	24.	25.	27.	28.	29.
30.	31.	32.	34.	35.	36.	37.	37.	38.	39.
40.	41.	42.	43.	43.	44.	45.	46.	46.	47.
48.	48.	49.	50.	50.	51.	51.	52.	53.	53.
54.	54.	59.	73.	100.	138.	179.	216.	247.	270.
289.	304.	316.	326.	334.	342.	348.	354.	359.	363.
367.	371.	374.	377.	380.	382.	385.	387.	389.	391.
393.	395.	396.	398.	399.	401.	402.	403.	405.	406.
407.	408.	409.	410.	411.	411.	412.	413.	414.	414.
415.	416.	416.	417.	417.	418.	419.	419.	420.	420.
420.	421.	421.	422.	422.	422.	423.	423.	423.	424.
424.	424.	425.	425.	440.	489.	587.	718.	854.	975.
1070.	1134.	1179.	1212.	1236.	1253.	1270.	1293.	1329.	1374.
1419.	1458.	1488.	1510.	1525.	1536.	1544.	1549.	1560.	1585.
1633.	1694.	1758.	1814.	1858.	1887.	1908.	1924.	1935.	1942.
1934.	1917.	1898.	1941.	2081.	2440.	3226.	4457.	5828.	6718.
6888.	6476.	5688.	4777.	4039.	3457.	2998.	2662.	2417.	2246.
2126.	2042.	1982.	1940.	1904.	1861.	1799.	1725.	1652.	1591.
1545.	1514.	1493.	1479.	1468.	1461.	1452.	1355.	1202.	999.
790.	606.	460.	364.	296.	247.	213.	188.	171.	159.
150.	144.	140.	137.	135.	133.	132.	131.	131.	131.
131.	131.	131.	131.	131.	131.	131.	131.	131.	131.
131.	131.	131.	131.	131.	131.	131.	131.	131.	131.
131.	131.	131.	131.	131.	131.	131.	131.	131.	131.
131.	131.	131.	131.	131.	131.	131.	131.	131.	131.

131.	131.	131.	131.	131.	131.	131.	131.	129.	128.
107.	86.	66.	47.	30.	23.	16.	12.	8.	6.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6888.	2149.	683.	656.	19674.
CMS	195.	61.	19.	19.	557.
INCHES		12.08	15.41	15.41	15.41
MM		306.95	391.31	391.31	391.31
AC-FT		1063.	1355.	1355.	1355.
THOUS CU M		1311.	1671.	1671.	1671.

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HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH RUSSELL TAYLOR DAM (10216)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10216	1	0	0	2	3	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-594.	-1

STAGE	594.00	594.50	595.00	596.00	602.00	606.00	614.50	616.00	617.40	620.10
	620.60	621.00	621.50	622.10						
FLOW	0.00	13.00	37.00	49.00	58.00	65.00	73.00	694.00	1900.00	8674.00
	8618.00	7654.00	8942.00	11983.00						
CAPACITY=	0.	30.	113.	513.	708.	796.	2062.			
ELEVATION=	585.	590.	600.	615.	620.	621.	640.			

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
594.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
621.0	0.0	0.0	0.

STATION 10216, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	2.	2.
2.	3.	3.	4.	4.	5.	5.	6.	6.	7.
8.	8.	9.	10.	11.	11.	12.	13.	15.	16.
18.	19.	21.	22.	24.	25.	27.	28.	30.	31.
33.	34.	36.	37.	37.	38.	38.	39.	39.	39.
40.	40.	41.	41.	42.	43.	45.	47.	49.	49.

SUMMARY OF PMF AND ONE-HALF PMF FLOOD ROUTING

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .50
HYDROGRAPH AT	10216	1.65 (4.27)	1	13775. (390.07)	6888. (195.04)
ROUTED TO	10216	1.65 (4.27)	1	11529. (326.48)	4730. (133.95)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ..... INITIAL VALUE SPILLWAY CREST TOP OF DAM

ELEVATION	594.00	594.00	621.00
STORAGE	30.	30.	796.
OUTFLOW	0.	0.	7654.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	622.31	1.01	863.	11529.	.78	16.08	0.00
.50	619.43	0.00	723.	4730.	0.00	16.17	0.00

PERCENT OF PMF FLOOD ROUTING
EQUAL TO SPILLWAY CAPACITY

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 10216
ROUTE HYDROGRAPH TO 10216
END OF NETWORK

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**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION       JULY 1978
  LAST MODIFICATION  26 FEB 79
**********

RUN  DATE= 79/07/17.
     TIME= 07.32.58.
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DAM SAFETY INSPECTION - MISSOURI
RUSSELL TAYLOR DAM (10216)
PERCENT OF PMF DETERMINATION AND ROUTING

JOB SPECIFICATION

NO	NWT	NPLN	IDAY	IHR	IPIN	METRC	IPLT	IPRT	NSTAN
100	0	5	0	3	0	0	0	4	0

JOPER	NMT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1

RTIOS=	.70	.71	.72	.73	.74	.75	.76	.77	.78

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SUB-AREA RUNOFF COMPUTATION

INPUT PRECIPITAION INDEX, RATIOS, AND UNIT HYDROGRAPH PARAMETERS

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10216	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	1.65	0.00	1.65	1.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	P12	R24	R48	R72	R96
0.00	24.70	100.00	120.00	130.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-90.00	0.00	0.00

CURVE NO = -98.00 WETNESS = -1.00 EFFECT CN = 98.00

UNIT HYDROGRAPH DATA
TC= 0.80 LAG= .35

RECESSION DATA
STRTQ= 0.00 QRCSN= 0.00 RTIOR= 1.00

END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q

SUM 32.11 30.81 1.30 393526.
(816.)(783.)(33.)(11143.42)

HYDROGRAPH ROUTING

ROUTE HYDROGRAPH THROUGH RUSSELL TAYLOR DAM (10216)

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
10216	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-594.	-1

STAGE	594.00	594.50	595.00	596.00	602.00	608.00	614.50	616.00	617.40	620.10
	628.60	621.00	621.50	622.10						
FLOW	0.00	13.00	37.00	49.00	58.00	65.00	73.00	694.00	1900.00	5674.00
	6618.00	7654.00	8942.00	11983.00						
CAPACITY=	0.	30.	117.	513.	748.	796.	2062.			
ELEVATION=	585.	594.	600.	615.	620.	621.	640.			

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
594.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
621.0	0.0	0.0	0.

PEAK OUTFLOW IS 7407. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 7548. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 7680. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 7784. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 7880. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 7993. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 8108. AT TIME 16.08 HOURS

PEAK OUTFLOW IS 8210. AT TIME 16.08 HOURS

PEAK OUTFLOW IS MSIR. AT TIME 18.00 HOURS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS								
				RATIO 1 .70	RATIO 2 .71	RATIO 3 .72	RATIO 4 .73	RATIO 5 .74	RATIO 6 .75	RATIO 7 .76	RATIO 8 .77	RATIO 9 .78
HYDROGRAPH AT	10216	1.69 (4.27)	1	9643. (273.05)	9780. (276.93)	9918. (280.85)	10056. (284.75)	10194. (288.65)	10331. (292.55)	10469. (296.46)	10607. (300.36)	10745. (304.26)
ROUTED TO	10216	1.69 (4.27)	1	7407. (209.74)	7508. (213.73)	7680. (217.46)	7784. (220.42)	7869. (223.39)	7993. (226.34)	8102. (229.43)	8210. (232.47)	8316. (235.47)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	594.00	594.00	621.00
STORAGE	30.	30.	796.
OUTFLOW	0.	0.	7694.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.70	620.90	0.00	791.	7407.	0.00	16.08	0.00
.71	620.96	0.00	794.	7548.	0.00	16.08	0.00
.72	621.61	.01	797.	7680.	.08	16.08	0.00
.73	621.05	.05	799.	7784.	.17	16.08	0.00
.74	621.09	.09	802.	7889.	.17	16.08	0.00
.75	621.13	.13	805.	7993.	.17	16.08	0.00
.76	621.17	.17	808.	8102.	.33	16.08	0.00
.77	621.22	.22	810.	8210.	.33	16.08	0.00
.78	621.26	.26	813.	8316.	.33	16.08	0.00